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New Palearctic species of the *Elachista bifasciella* group (Lepidoptera: Gelechioidea, Elachistidae)

L. Kaila

Abstract

Based on combination of evidence derived from DNA barcodes and diagnostic features of morphology, sixteen new Palearctic species of the taxonomically challenging *Elachista bifasciella* group are described: *E. arta* Kaila, sp. n. (Kyrgyzstan), *E. praestans* Kaila, sp. n. (Slovenia), *E. narynella* Kaila, sp. n. (Kyrgyzstan), *E. sebastella* Kaila, sp. n. (Greece, Crete), *E. ipirosella* Kaila, sp. n. (Greece), *E. sobiella* Kaila, sp. n. (Russia, Polar Ural), *E. chukotica* Kaila, sp. n. (Russia, Chukchi Peninsula), *E. enaula* Kaila, sp. n. (Russia, Magadan region), *E. gravasta* Kaila, sp. n. (Russia, S. Ural), *E. clivella* Kaila, sp. n. (Russia, Altai), *E. epemba* Kaila, sp. n. (Russia, Altai), *E. diodia* Kaila, sp. n. (Russia, Polar Ural), *E. tephрина* Kaila, sp. n. (Kyrgyzstan), *E. tuba* Kaila, sp. n. (Russia, S. Siberia), *E. austera* Kaila, sp. n. (Turkey) and *E. vulturna* Kaila, sp. n. (Ukraine, Crimea).

KEY WORDS: Lepidoptera, Gelechioidea, Elachistidae, *bifasciella* group, new species, DNA barcodes, Palearctic.

Nuevas especies Paleárticas del grupo de *Elachista bifasciella* (Lepidoptera: Gelechioidea, Elachistidae)

Resumen

Sobre la base de la combinación de pruebas obtenidas del código de barras del ADN y las características del diagnóstico de su morfología, se describen dieciséis nuevas especies Paleárticas del complicado grupo taxonómico de *Elachista bifasciella*: *E. arta* Kaila, sp. n. (Kirguizistán), *E. praestans* Kaila, sp. n. (Eslovenia), *E. narynella* Kaila, sp. n. (Kirguizistán), *E. sebastella* Kaila, sp. n. (Grecia, Creta), *E. ipirosella* Kaila, sp. n. (Grecia), *E. sobiella* Kaila, sp. n. (Rusia, Polar Ural), *E. chukotica* Kaila, sp. n. (Rusia, Península de Chukchi), *E. enaula* Kaila, sp. n. (Rusia, región de Magadán), *E. gravasta* Kaila, sp. n. (Rusia, S. Ural), *E. clivella* Kaila, sp. n. (Rusia, Altai), *E. epemba* Kaila, sp. n. (Rusia, Altai), *E. diodia* Kaila, sp. n. (Rusia, Urales Polares), *E. tephрина* Kaila, sp. n. (Kirguizistán), *E. tuba* Kaila, sp. n. (Rusia, S. Siberia), *E. austera* Kaila, sp. n. (Turquía) y *E. vulturna* Kaila, sp. n. (Ucrania, Crimea).

PALABRAS CLAVE: Lepidoptera, Gelechioidea, Elachistidae, grupo *bifasciella*, nuevas especies, DNA código de barras, Paleártica.

Introduction

The *Elachista bifasciella* group is a predominantly Holarctic species group of *Elachista*, yet species are also known from Australia and New Zealand (DUGDALE, 1988, KAILA, 1999b, 2011a). The *E. bifasciella* group may be paraphyletic in a global context with a series of intermediate forms to other species groups occurring in Australia. These no longer ‘missing links’ actually link the *E. bifasciella* group to, e.g., some tropical, morphologically apparently distinctive groups, and, for instance, the more familiar *E. freyerella* group that was formerly known as the genus *Cosmiotes* (KAILA & SUGISIMA, 2011). Nevertheless, in the northern hemisphere, the *E. bifasciella* group is well characterized and therefore a useful entity for practical taxonomy. The group has been defined and

characterized by TRAUGOTT-OLSEN & NIELSEN (1977) and KAILA (1999b). The landmark work for the Palearctic taxa of this group was the book of TRAUGOTT-OLSEN & NIELSEN (1977) which treated the species of Fennoscandia, but included diagnoses of a majority of European species. Since that work, only relatively few species of this group have been added to the European fauna (KYRKI & KARVONEN, 1985, BUSZKO, 1989, KAILA & KERPPOLA, 1992, ALBRECHT & KAILA, 1994, KAILA & JALAVA, 1994, KAILA, 1998, HUEMER, 2000, PARENTI, 2002, NEL, 2003, AARVIK & BERGGREN, 2004, KAILA *et al.*, 2008, SAVENKOV, 2013). In the Palearctic region outside Europe the few contributions including descriptions of new species, are by SRUOGA (1990), SRUOGA & PUPLESIS (1992), KAILA (1992), SINEV & SRUOGA (1995), and SUGISIMA (2005). In total, about 70 species of the *E. bifasciella* group have been recorded from the Palearctic region.

Barcoding has shown promise in helping to resolve the taxonomy of Elachistinae (KAILA & STÅHL, 2006, KAILA & MUTANEN, 2012). As a part of a barcoding project encompassing World Elachistinae, a particular work was undertaken regarding the Palearctic species of the *E. bifasciella* group (MUTANEN *et al.*, 2013). Samples of as many as possible species were barcoded, and additionally, a large number of unidentified specimens, or specimens suspected of belonging to new species or to potentially unresolved species complexes were barcoded. Due to the lack of suitable samples, the fauna of Japan and the Russian Far East was excluded from the work. A total of 437 specimens with successful barcodes were included. As a result, several species were found to express considerable (>1%) intraspecific variation and likewise clusters of unidentified specimens showing a distinct gap (>1%) from any pre-identified specimens. Altogether, twenty-five such cases were detected. A close morphological scrutiny was undertaken of the separately clustered groups, as well as of the species that showed considerable haplotype diversification. Further information of the genetic divergences among the studied representatives of the *E. bifasciella* group is presented in MUTANEN *et al.* (2013). Sixteen of the taxa that differed from others by their barcodes also showed differences in morphological characters comparable to those that differentiate the established species from each other. They were tentatively recognized as new species by MUTANEN *et al.* (2013) and are formally described here. The association of males to females, when otherwise uncertain, is based on barcodes.

None of the newly described species are, according to morphology, the same as any of the species reported from the Russian Far East or Japan (SINEV & SRUOGA, 1995, SUGISIMA, 2005), or any of such named Palearctic or Nearctic species of which no barcoded sample was available. However, in the case of allopatry the judgement of whether different populations represent different species or intraspecific populations is subjective. Among the taxa treated in this paper, *E. subnigrella*, *E. tuba* and *E. tephрина* form a tight complex of apparently allopatric taxa in terms of both barcodes and morphology. The present author has decided to treat *E. tuba* and *E. tephрина* as distinct species due to their small but constant differences in both their barcodes and morphology.

The material of the newly described species was obtained from the following collections:

- MZH Finnish Museum of Natural History, Helsinki, Finland (L. Kaila)
- ZMUC Zoological Museum of the University of Copenhagen, Denmark (O. Karsholt)
- SZMN Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia (V. Dubatolov)
- ZIN Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (S. Sinev)

Scientific collections of K. & T. Nupponen (holotypes currently deposited in collection of Nupponen can be borrowed through MZH), J. Junnilainen and Z. Tokár.

Nomenclature of characters follows TRAUGOTT-OLSEN & NIELSEN (1977) and KAILA (1999a & b, 2011a). All names are nomina in apposition.

***Elachista arta* Kaila, sp. n.** (Figs. 1, 2, 25, 52)

Holotype ♂, Kyrgyzstan 39° 38' 51" N 72° 14' 00" E, Alai Mts., Tengiz-Bai Pass, 3650 m, 23-VII-2010, K. Nupponen & R. Haverinen leg., L. Kaila prep. 5370, DNA sample 21476 Lepid. Phyl.,

coll. Nupponen; paratypes 8 ♂♂, 3 ♀♀, with the same collecting data as in the holotype, L. Kaila prep. 5371, 5676, DNA sample 21477 Lepid. Phyl., coll. Nupponen, 1 ♂, 1 ♀ coll. MZH.

Diagnosis: *Elachista arta* is a very narrow-winged, pale yellow species whose female wings are somewhat reduced so that its ability to fly seems limited, especially as the abdomen is disproportionately large. It is externally more similar to some species in sg. *Aphelosetia* than any named one in the *E. bifasciella* group. It most closely resembles species of the *E. hedemanni* complex (see KAILA, 2012). The genitalia, however, readily distinguish these taxa and place *E. arta* in the *E. bifasciella* group. This species cannot be mistaken biology for any other species in this complex due to its exceptional appearance.

Description of male: Forewing length 4-5 mm. Labial palpus ascending, 1.2 times as long as diameter of head, yellow. Head, thorax, scape and pedicel pale yellow; flagellum grey; legs pale yellowish grey. Forewing narrow, yellow, with concolorous fringe, underside grey, apically yellow, fringe scales basally yellow, distally grey. Both sides of hindwing grey with concolorous fringe on upper side, fringe yellow below.

Female: Otherwise as male but wings somewhat reduced, forewing length 3.5 mm; also hindwing pale yellow on both upper and underside; abdomen disproportionately large.

Male genitalia: Uncus lobes rounded, widely separated from each other, median margin almost straight or slightly convex, lateral and distal margin evenly curved. Spinose knob of gnathos wider than long, large. Valva shape average for *E. bifasciella* group, nearly straight, parallel-sided, basal fold of costa extended to distal 3/4 of valva where it meets distal lobe and forming broad, indistinct hump, sacculus basally slightly truncated, distally straight. Digitate process 1/4 as long as valva, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at an obtuse angle, distal margin truncate, setose. Vinculum narrow, abruptly tapered into short saccus, median ridge absent. Phallus almost 3/4 as long as valva, weakly bent as s-shaped, distal end pointed in lateral view, straight-cut in ventral view, without cornuti.

Female genitalia: Apophyses nearly straight, apophyses posteriores 1.5 times as long as apophyses anteriores. Ostium bursae incised in sternum 7, posterior margin somewhat concave, occupying about 1/3 of the distance between apophyses anteriores; antrum slightly longer than wide, wine glass-shaped. Colliculum occupying most of the caudal part of ductus bursae, 1.5 times as long as apophyses posteriores; ductus seminalis incepted near middle of ductus bursae including antrum, narrow, tubular, without basal dilation; ductus bursae gradually widened towards corpus bursae with which it is incepted without distinct border, tubular and membranous. Corpus bursae with small internal granules. Signum rather small, elongate, broadest in the middle, with a few teeth along margins.

Biology: the specimens known have been collected at late night by a black light trap that had been dug in soil; it is likely that this has enabled the females also to be caught. The habitat of the type locality is a xerothermic slope at high altitude (K. Nupponen, personal communication).

Distribution: only known from the type locality which is at high altitude in Kyrgyzstan.

Remarks: This species is referred to as *Elachista* sp. 06MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is *E. fuscofrontella* Sruoga (distance 6.56 %). This level of divergence does not, however, give any reliable support for a conclusion on the affinities of *E. arta*.

Elachista praestans Kaila, sp. n. (Figs. 3, 4, 26, 53)

Holotype ♂: Slovenia, Juliške Alpe, Mangart, 2000 m, 7-VII-2000, Z. Tokár leg., L. Kaila prep. 4792, DNA sample 21377 Lepid. Phyl., coll. Tokár; paratypes 3 ♂♂, 2 ♀♀; 3 ♂♂, 1 ♀ with the same collecting data as in the holotype, L. Kaila prep. 5680, DNA sample 21382 Lepid. Phyl., coll. Tokár, L. Kaila prep. 5701, DNA sample 22165, coll. Tokár, 1 ♂ in coll. MZH, Slovenia, Soriška Planina, 1500 m, 1 ♀, 6-VII-2000, Gen. pr. ZT ♀ N° 6856, LK prep. 5700, coll. Tokár.

Diagnosis: *Elachista praestans* is a unicolorous yellowish cream species with a not particularly narrow wing shape. As such it is externally similar to species of the subgenus *Aphelosetia* of *Elachista*,

notably some species in the *E. dispilella* complex (see TRAUGOTT-OLSEN, 1990), *E. slivenica* Kaila, 2007 of the *E. bedellella* complex (see KAILA, 2007), and species of the *E. catalana*, *E. pollutella* and the pale yellow representatives of the *E. cingillella* complexes (see TRAUGOTT-OLSEN & NIELSEN, 1977, KAILA, 2011b, c, KAILA & JUNNILAINEN, 2002). All of these have entirely different genitalia that will readily differentiate *E. praestans*. In the *E. bifasciella* group *E. stenopterella* Rebel, 1932, *E. wieseriella* Huemer, 2000 and *E. anserinelloides* Nel, 2003 are externally similar species with unicolorous pale yellow forewings. Of these, *E. anserinelloides* is readily distinguishable from the other species by the presence of two prominent cornuti in the male genitalia. *E. stenopterella* and *E. wieseriella* are close to each other and to *E. praestans*. Of these, *E. wieseriella* has dark antennae and the forewing costa is basally dark grey; in the male genitalia the gnathos is rounded, oval in *E. stenopterella* and *E. praestans*. The valva is also narrower in *E. wieseriella* than in the two other species. *E. praestans* and *E. stenopterella* are externally similar. They differ from each other by the broader valva and the distally narrowly bifurcate phallus of *E. praestans*; the hump of costa is pronounced in *E. praestans*, not so in *E. stenopterella*. The apex of the phallus of *E. stenopterella* is broadly bifurcate; the juxta lobes are rounded in their distal half in *E. praestans*, but laterally prolonged in *E. stenopterella* (see HUEMER, 2000). The female genitalia of *E. praestans* and *E. wieseriella* differ in the shape of the ostium bursae, antrum and colliculum. The ostium bursae is wide with concave median margin in *E. praestans*, laterally delimited by dorsolaterally directed lateral rims, the length of which is equal to the width of the antrum. The ostium bursae of *E. wieseriella* has a straight median margin, and its width is about 1/4 of the distance of the apophyses anteriores. Its lateral rims are very short. The antrum is barrel-shaped, like in *E. wieseriella* of the *E. subnigrella* complex, and its colliculum is narrow. The antrum of *E. praestans* is narrower and the colliculum broader than in *E. wieseriella*, thus the antrum is not so abruptly delineated from the colliculum (cf. HUEMER, 2000). The female of *E. stenopterella* is unknown.

Description: Forewing length 5.5 mm. Labial palpus ascending, 1.2 times as long as diameter of head, yellow. Head, thorax, scape and pedicel pale yellow; flagellum grey; legs pale yellowish grey. Forewing creamy yellowish with concolorous fringe, underside dark grey with creamy fringe scales. Hindwing pale grey with concolorous fringe on upper side, underside dark grey with creamy fringe.

Male genitalia: Uncus lobes elongate, about 1.5 times as long as wide, separated from each other by a broad V-shaped incision, median margin basally concave, distally slightly convex, distal and lateral margin rounded. Spinose knob of gnathos oval-shaped, rather small. Valva narrowest basally, otherwise broad, basal fold of costa extended to distal 3/4 of valva where it meets distal lobe and forms a distinct hump, sacculus medially truncated, straight between middle and distal 1/4, apically bent towards dilated cucullus. Digitate process 1/4 as long as valva, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin without an angle, distal margin rounded, setose. Vinculum V-shaped, abruptly tapered into short saccus, median ridge present. Phallus 3/4 as long as valva, broad, weakly bent as s-shaped, distal opening extended to fl length of phallus, ventrally with narrow keel, dorsal end narrowly bifurcate, without cornuti; caecum prominent, basal opening dorsally projected.

Female genitalia: Apophyses nearly straight and stout, apophyses posteriores 1.5 times as long as apophyses anteriores. Ostium bursae slightly incised in sternum 7, wide, concave, occupying half of the distance between apophyses anteriores, laterally delimited by dorsolaterally directed lateral rims, the length of which is equal to the width of antrum, dorsal wall broadly covered by small spines. Antrum indistinctly delimited, twice as long as wide; antrum + colliculum nearly half of the total length of ductus bursae; caudal part of ductus bursae twice as long as apophyses posteriores; ductus seminalis incepted near middle of ductus bursae including antrum, narrow and tubular, with small basal swelling; posterior half of ductus bursae broad, tubular and membranous, abruptly incepted to corpus bursae. Corpus bursae medially with small internal granules. Signum elongate, broadest medially, dentate.

Biology: Immature stages unknown. Adults have been taken at high altitude.

Distribution: Juliške Alpe, Slovenia.

Remarks: This species is referred to as *Elachista* sp. 05MM in MUTANEN *et al.* (2013). Of the

species included in that work the closest taxon in terms of similarity of barcodes is *E. anserinella* Stainton (distance 6.9 %). This level of divergence does not, however, give any reliable support for a conclusion on the affinities of *E. praestans*. The morphology suggests that *E. praestans* is closest to *E. stenopterella* Rebel that was not included in MUTANEN *et al.* (2013).

***Elachista narynella* Kaila, sp. n.** (Figs. 5, 27)

Holotype ♂: USSR, Kirgisia [Kyrgyzstan], 41° 40' N 76° 31' E, 2650 m, open *Picea* forest, 31-VII-1990 ad luc., L. Kaila & K. Mikkola leg., L. Kaila prep. 379, DNA sample 21421 Lepid. Phyl., coll. MZH.

Diagnosis: *Elachista narynella* is externally characterized by the slender forewing shape and the costal and tornal spot being fused to form an oblique outer fascia. More or less similar outer appearance with two uninterrupted fasciae is also found in *E. bifasciella* Treitschke, 1833, *E. dimicatella* Rebel, 1903 and *E. bicingulella* Sruoga, 1992 which all, however, have nearly black forewing ground colour; the ground colour is grey in *E. narynella*. *E. dimicatella* is readily distinguished by its weakly sclerotized, peculiarly positioned uncus lobes; *E. bifasciella* has conical uncus lobes and a very narrow digitate process. The male genitalia of *E. narynella* have similarities to those of *E. albifrontella* (Hübner, [1817]), *E. albicapilla* Höfner, 1918, and *E. fuscofrontella* Sruoga, 1990, from all of which it can be distinguished by the much larger uncus lobes of these species as compared to those of *E. narynella*. *E. bicingulella* also has significantly larger uncus lobes than *E. narynella*; the juxta lobes of *E. narynella* are rounded, mesially produced in *E. bicingulella*; the saccus is very long in *E. narynella*, short in *E. bicingulella*.

Description: Forewing length 4.8 mm. Labial palpus ascending, approximately 1.3 times as long as diameter of head, fuscous both above and below. Head, neck tuft and antenna leaden grey. Tegula grey with pale grey apex. Thorax grey, posteriorly with pale grey scales. Fore and mid leg dark grey, with paler distal ring in tibia and tarsal articles. Hind leg pale grey, with pale distal ring in tibia and tarsal articles, spurs darker grey. Forewing ground colour grey, scattered with dark grey tipped scales; distal/mottled, dark grey; with two white fasciae: a basal fascia from 2/5 of costa to middle of dorsum, and another at 4/5 of wing length, formed of confluent costal and dorsal spots. Fringe grey, some fringe scales distally dark grey forming indistinct fringe line. Underside grey with concolorous fringe. Hindwing grey both above and below, with concolorous fringe.

Male genitalia: Uncus lobes slightly longer than wide, median margin almost straight, lateral and distal margin evenly curved; uncus lobes widely apart from each other. Spinose knob of gnathos rounded. Valva straight, basal fold of costa extended to distal 3/4 of valva where it meets distal lobe and forms broad hump. Digitate process 1/3 as long as valva, narrow, posterior margin distally oblique, with a few setae distally. Mesial margin of juxta lobes convex, meeting distal margin without an angle, distal margin rounded, setose. Vinculum narrow, abruptly tapered into long and narrow saccus, median ridge indistinct. Phallus almost as long as valva, almost straight and narrow, distally tapered into bent apex in lateral view; without cornuti; caecum rounded, posterior opening of phallus dorsally projected.

Female genitalia: Unknown.

Biology: the single known specimen has been taken in active flight before sunset in an open, montane spruce forest with rich meadow understorey vegetation.

Distribution: Only known from the type locality near Naryn in Kyrgyzstan.

Remarks: This species is referred to as *Elachista* sp. 04MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is *E. griseella* (Dup.) (distance 6.53 %). This level of divergence does not, however, give any reliable support for a conclusion on the affinities of *E. narynella*.

***Elachista sebastella* Kaila, sp. n.** (Figs. 6, 28, 29)

Holotype ♂, Greece, Crete, 2 km NNE Omalos, 1000 m, 2-V-2012, J. Tabell leg., L. Kaila prep.

5675, DNA sample 21649 Lepid. Phyl., coll. MZH; paratypes 3 ♂♂, Greece: Crete, W. Omalos, 1000-1150 m, 35° 21.35' E 23° 54.60' E 7-V-2007, M. Fibiger, G. Jeppesen, M. Top-Jensen & A. Madsen leg., L. Kaila prep. 4998, 4999, coll. ZMUC.

Diagnosis: *Elachista sebastella* is a relatively large species. Its forewing ground colour is formed of basally white and distally grey scales giving a strongly mottled appearance. Apart from the white fascia and the confluent costal and dorsal spots, the most distinctive markings, also visible in worn specimens, are a dark grey spot between the fold and the dorsal margin at middle of wing length, as well as the darker grey colour at apical fifth of the forewing. The labial palpi are shorter than in most species of the *E. bifasciella* group. The male genitalia are characterized by the elongate uncus lobes. The caecum is almost absent, and the distal opening of phallus is posteriorly projected. These traits separate *E. sebastella* from the externally similar, though smaller, *E. herrichii* Frey, 1859 and *E. clivella* sp. n. *Elachista austera* sp. n. is externally somewhat similar as being a large and relatively pale coloured species. It is more evenly coloured, without a distinct dark spot in the middle of wing or the dark apex. These species can be easily distinguished by the male genitalia (see diagnosis of *E. austera*).

Description: Forewing length 5 mm. Labial palpus ascending, as long as diameter of head, creamy white above, below fuscous. Head creamy or ochreous white, with dark tipped scales above. Neck tuft concolorous with head. Tegula grey, distally creamy white. Thorax mottled grey. Scape grey, intermixed with creamy white scales. Pedicel and flagellum grey. Femur, tibia and tarsal articles of fore and mid legs leaden grey with white distal rings. Hind leg grey laterally, otherwise ochreous, with white distal ring in tibia and tarsal articles. Forewing ground colour formed of basally pale and distally grey scales making a mottled grey appearance; with three indistinctly delineated, white markings: somewhat outward bent, medially weakly discernible fascia across wing at 1/3 of wing length, white costal spot near apex, and similar tornal spot situated more basally near apex of dorsal margin; dark grey elongate spot variably between fold and dorsal margin, or at dorsal margin at middle of wing. Basal, broad fringe scales basally pale grey, distally dark grey and forming dark grey fringe line; thin, distal fringe scales pale grey. Hind wing grey above. Underside of forewing and both sides of hindwing dark grey, fringe scales at apical third of forewing yellow.

Male genitalia: Uncus lobes elongate, twice as long as wide, median margin almost straight or slightly concave, lateral and distal margin evenly curved; separated from each other by a wide U-shaped incision. Spinose knob of gnathos rounded, of average size within *E. bifasciella* group. Valva straight, parallel-sided, basal fold of costa extended to distal 3/4 of valva where it meets distal lobe and forms broad, indistinct hump, sacculus basally slightly truncated, distally straight. Digitate process 1/4 as long as valva, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at an obtuse angle, distal margin setose. Vinculum narrow, abruptly tapered into short saccus, median ridge absent. Phallus about 3/5 as long as valva, nearly straight, distal end distinctly sclerotized, pointed in lateral view, tapered and bifurcate in ventral view, without cornuti; basal opening posteriorly projected, caecum small.

Female genitalia: Unknown.

Biology: Unknown.

Distribution: Only known from Mt. Omalos in Greece: Crete.

Remarks: This species is referred to as *Elachista* sp. 15MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is *E. ipirosella* sp. n. (distance 4.14 %). This level of divergence does not give a reliable support for a conclusion on the affinities of *E. sebastella*.

***Elachista ipirosella* Kaila sp. n.** (Figs 7, 8, 30, 54)

Holotype ♂: Greece, Ipiros [Epirus], S. Metsova [Metsovo], 1200-1900 m, 27-28-V-1994, O. Karsholt leg., L. Kaila prep. 2335, DNA sample 21455 Lepid. Phyl., coll. ZMUC; paratype, 1 ♀, with the same collecting data as in the holotype; L. Kaila prep. 4739, DNA sample 20857 Lepid. Phyl., coll. ZMUC.

Diagnosis: *E. ipirosella* is a close relative of *E. maculosella* Chrétien, 1896. Both species are characterized by the prominent, distinctly sclerotized female papillae anales which resemble those of some members of the *Elachista argentella* group (see, e.g. TRAUGOTT-OLSEN & NIELSEN, 1977, KAILA, 2012, KAILA & MUTANEN, 2012) rather than any members of the *E. bifasciella* group, the externally distinctive *E. nobilella* Zeller, 1839 excepted. The similarity of *E. ipirosella* to the members of sg. *Apheloseitia* is further increased by the pale, irregularly patterned forewings, typical of many species in *Apheloseitia* but less common in the *E. bifasciella* group. Among the species of the *E. bifasciella* group *E. ipirosella* somewhat resembles *E. gruenewaldi* Parenti, 2002 which is known from the Dolomites in northern Italy (PARENTI, 2002). The female of *E. gruenewaldi* is unknown, but the male genitalia of these species differ as follows: the apex of the phallus and the digitate process are broader, and the juxta lobes are smaller and with convex lateral margin in *E. ipirosella*, as compared to *E. gruenewaldi*. *E. ipirosella* male can be identified from the closely related *E. maculosella* Chrétien, 1896 by its narrower valva, larger and more elongate uncus lobes, and shorter juxta lobes (Fig. 31). The female genitalia of these species differ by the shape of the antrum which is broad, wine glass-shaped with distinctly convex posterior margin in *E. maculosella* (Fig. 55); the antrum is short and parallel-sided, with straight posterior margin in *E. ipirosella*.

Description: Forewing length: ♂ 4.5 mm, ♀ 3.8 mm. Labial palpus straight, length approximately equal to diameter of head, dirty white. Head and neck tuft dirty white; scape of antenna grey, intermixed with paler grey scales, pedicel and flagellum of male unicolorous grey, those of female grey, distinctly annulated with nearly white rings. Tegula and thorax mottled grey, apically dirty white. Femur of fore and mid legs dark grey, with paler distal ring, tibia and tarsal articles dark grey laterally, otherwise grey with pale grey distal rings in tibia and tarsal articles. Hind leg grey laterally, otherwise pale grey, with pale distal ring in tibia and tarsal articles, spurs somewhat darker grey. Forewing ground colour dirty white, scattered with dark grey tipped especially distally, scales along costa wing more unicolorously grey; in female dark-tipped scales concentrated on median and distal parts of wing, so that traces of pale fascia and costal and tornal spots are decipherable. Fringe dirty white, some fringe scales distally dark brownish grey forming indistinct fringe line. Hindwing grey with concolorous fringe. Underside of both wings dark grey with generally concolorous fringe, fringe at forewing dorsal margin paler.

Male genitalia: Uncus lobes rounded, median margin almost straight, lateral and distal margin evenly curved; uncus lobes separated from each other by wide V-shaped incision. Spinose knob of gnathos wider than long, of average size within *E. bifasciella* group. Valva long, slightly bent, broadest distally, basal fold of costa extended to distal 3/4 of valva where it meets distal lobe and forms indistinct hump. Digitate process 1/5 as long as valva, very broad, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at a right angle, distal margin truncate, setose. Vinculum narrow, abruptly tapered into short saccus, median ridge distinct. Phallus 2/3 as long as valva, straight, distal end broad, bifurcate; without cornuti; caecum rounded, posterior opening of phallus dorsally projected.

Female genitalia: Papillae anales triangular in lateral aspect, twice as long as broad at broadest place, acute-tipped, ventral margin curved in basal half; ventral part densely covered by minute spines, otherwise with a few long setae. Apophyses posteriores stout, somewhat bent, as long as papillae anales. Apophyses anteriores as long as apophyses posteriores. Ostium bursae in anterior margin of tergum 8, occupying nearly the whole space between apophyses anteriores, posterior margin straight; antrum very short, with some minute spines; colliculum weakly sclerotized, broad, as long as apophyses; ductus seminalis inserted posterior to colliculum; anterior part of ductus bursae tubular, membranous, as long as colliculum, with some small granules near inception of corpus bursae; inepted into corpus bursae without clear limit; corpus bursae 1.3 times as long as the whole ductus bursae, pear-shaped, with small internal granules; signum small, dentate, star-shaped.

Biology: Unknown.

Distribution: Only known from the type locality in north-western Peloponnesus, Greece.

Remarks: This species is referred to as *Elachista* sp. 09MM in MUTANEN *et al.* (2013). Of the

species included in that work the closest taxon in terms of similarity of barcodes is *E. maculosella* (Chrét.) (distance 2.18 %). This affinity is also supported by morphology.

***Elachista sobiella* Kaila, sp. n.** (Figs. 9, 32, 33)

Holotype ♂, Russia, Polar Ural, 66° 55' N 65° 10' E, Krasnyi Kamen, 200 m, sandy riverside meadow, 2-VII-1994, Jalava, Koponen & Kullberg leg., L. Kaila prep. 1209, DNA sample 16181 Lepid. Phyl., coll. MZH; paratype 1 ♂, with the same collecting data as in the holotype, L. Kaila prep. 2090, DNA sample 12421 Lepid. Phyl., coll. MZH.

Diagnosis: *Elachista sobiella* is externally similar to *E. alpinella* Stainton, 1854, *E. enaula* Kaila, sp. n. and *E. kilmunella* Stainton, 1849. Unlike other species, *E. kilmunella* has distally white fringe scales at termen; they are entirely grey in the otherwise externally similar *E. sobiella*. *E. alpinella* differs from *E. sobiella* by the shape of the fascia that does not extend to the costa in *E. alpinella*, unlike in *E. sobiella*. *E. alpinella* also has a black spot outside the fascia in the middle of the wing that *E. sobiella* lacks. Male genitalia of *E. sobiella* resemble closest those of *E. alpinella* and *E. chukotica* Kaila, sp. n. The very small spinose knob of gnathos of *E. sobiella* is diagnostic, and the narrower and longer valvae also characterize *E. sobiella* as compared to *E. alpinella*. *E. chukotica* is externally different as being unicolorous shiny grey. Its uncus lobes are larger, and the cornutus is smaller than in these other species. The genitalia of *E. kilmunella* differ from those of *E. sobiella* in many aspects, see TRAUGOTT-OLSEN & NIELSEN (1977) and KAILA (1999b) for their characterization. Even though *E. sobiella* appears to be a close relative of *E. eskoi* Kyrki & Karvonen, 1985, these species can hardly be confused; see KYRKI & KARVONEN (1985) for the description of *E. eskoi*. *E. eskoi* is a usually very large species, with characteristic shaped uncus lobes, and both the valva and phallus are long and narrow; its phallus contains two large, curved cornuti. *E. sobiella* differs from *E. enaula* as explained under the diagnosis of *E. enaula*.

Description: Forewing length 5 mm. Labial palpus ascending, 1.2 times as long as diameter of head, very pale grey above, grey below. Scales of head and neck tuft shiny pale grey. Tegula, thorax and antenna grey. Femur, tibia and tarsal articles of fore and mid legs leaden grey, with white distal rings. Hind leg pale grey, with white distal ring in tibia and tarsal articles, basal 2/3 of tibia pale ochreous grey. Forewing ground colour formed of basally pale and distally dark grey scales making a mottled grey appearance; with three white markings: medially outward angled fascia across wing in 2/3 of wing length, white costal spot near apex, and similar tornal spot situated more basally near apex of dorsal margin, the spots confluent forming an outward angled outer fascia. Fringe scales grey. Underside of forewing and both sides of hindwing grey with concolorous fringe.

Male genitalia: Uncus lobes relatively large, rounded, median margin convex, lateral and distal margins evenly curved; separated from each other by a broad U-shaped incision. Spinose knob of gnathos rounded, rather small. Valva narrow, parallel-sided, somewhat bent, basal fold of costa extended to distal 3/4 of valva where it meets distal lobe and forms broad and indistinct hump; sacculus with small distal spine, meeting cucullus at a right angle. Digitate process 1/4 as long as valva, rather broad, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at a right angle, distal margin medially somewhat concave, otherwise rounded; juxta lobes broadly setose. Vinculum abruptly tapered into narrow saccus, no median ridge visible. Phallus 4/5 as long as valva, straight, broadest basally, gradually tapered towards straight-cut apex; vesica with two distinct cornuti: one horn-shaped at middle of phallus, another similar or bifurcate nearer apex; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Unknown.

Biology: The specimens have been collected by net on a sandy riverside meadow.

Distribution: Only known from the type locality in northern Urals, Russia.

Remarks: This species is referred to as *Elachista* sp. 03MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is *E. eskoi* Kyrki & Karvonen, 1985 (distance 1.39 %). *E. eskoi* is, however, distinctive in terms of morphology (cf. KYRKI & KARVONEN, 1985, and Diagnosis above).

***Elachista chukotica* Kaila, sp. n.** (Figs. 10, 34)

Holotype ♂, USSR [Russia], Chukchi Pns., 64° 55' N 172° 30' E, 45 km N Provideniya, Pestsovaya r. valley, 14-VII-1991, K. Mikkola leg. B. Å. Bengtsson prep. 396X, DNA sample 16120 Lepid. Phyl., coll. MZH.

Diagnosis: *Elachista chukotica* is a nearly unicolorous, shiny dark grey species. As such, it somewhat resembles *E. tanaella* Aarvik & Berggren, 2004 but is darker, *E. diodia* Kaila, sp. n. and *E. jaskai* Kaila, 1998. The male genitalia of all these species are diagnostic; the uncus lobes of *E. tanaella* are smaller and the phallus longer and narrower than in the other species; the spinose knob of gnathos is very small and the tegumen very large in *E. diodia* as compared to these species, and the digitate process of *E. jaskai* is larger than in any other species known in the *E. bifasciella* group (see KAILA, 1998). The male genitalia of *E. chukotica* most resemble those of *E. alpinella* and *E. sobiella*. Of these species, the valva is smaller in *E. alpinella* than in the other species (see, e.g. TRAUGOTT-OLSEN & NIELSEN, 1977, KAILA, 1999b). *E. chukotica* has one small cornutus, *E. sobiella* has two distinctive cornuti. The uncus lobes and spinose knob of the gnathos are larger in *E. chukotica* than in *E. sobiella*. No named similar species is known from North America (see KAILA 1999b). Perhaps closest is *E. olarinella* Kaila, 1999, known from Alaska. It is, however, easy to distinguish from *E. chukotica* by its considerably smaller uncus lobes and longer and thinner phallus.

Description: Forewing length 5 mm. Labial palpus ascending, 1.3 times as long as diameter of head, second segment white above, otherwise grey. Head, neck tuft, tegula, scape and pedicel pale shiny grey, flagellum grey. Legs grey, tibia and tarsal articles slightly paler. Forewing shiny grey; medially with basally pale grey scales, and distally with scales being distally somewhat darker; no other pattern discernible. Fringe scales concolorous. Underside of forewing and both sides of hindwing grey with concolorous fringe.

Male genitalia: Uncus lobes large, rounded, median margin straight, lateral and distal margin evenly curved; separated from each other by a narrow U-shaped incision. Spinose knob of gnathos rounded, of average size within *E. bifasciella* group. Valva straight, broad, parallel-sided, basal fold of costa extended to distal 2/3 of valva where it meets distal lobe and forms broad, indistinct hump, sacculus medially slightly truncate, distally bent towards cucullus, with a small distal spine. Digitate process 1/4 as long as valva, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at an obtuse angle, distal margin medially somewhat produced, setose. Vinculum broad, abruptly tapered into narrow saccus, median ridge absent. Phallus about 3/4 as long as valva, straight, broadest basally, gradually tapered towards straight-cut apex; vesica with small and narrow cornutus at apical part; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Unknown.

Biology: Unknown.

Distribution: Only known from the type locality in the Chukchi Peninsula, Russia.

Remarks: This species is referred to as *Elachista* sp. 01MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is *E. kilmunella* Stainton (distance 2.66 %). Morphology also supports the affinity of these species which belong to a larger, morphologically compact complex of predominantly northern species, even if these species do not appear to be morphologically the most similar ones within the complex.

***Elachista enaula* Kaila, sp. n.** (Figs. 11, 12, 35, 36, 56)

Holotype ♂, Russia, Magadan obl., 59° 34' N 151° 12' E, 15 km E Magadan, steep shore meadow, 0-100 m, 8-VII-1997 J. Jalava & T. Tammaru leg., L. Kaila prep. 5666, DNA sample 20908 Lepid. Phyl., coll. MZH; paratypes 1 ♂, 3 ♀♀, with the same collecting data as in the holotype, L. Kaila prep. 5666, 5669, 5670, DNA samples 20914-20917 Lepid. Phyl., coll. MZH.

Diagnosis: *Elachista enaula* is a fairly large species of the *E. bifasciella* group. The male in particular is dark, externally rather similar to many other species, especially several species in the

Nearctic *E. leucofrons* and *E. stramineola* complexes in the sense of KAILA (1999b). Of these species the genitalia readily distinguishes them as follows. The cornuti of the species of *E. leucofrons* and *E. stramineola* species complexes are always close to the apex of the phallus, not so in *E. enaula*. In the female genitalia the long, sclerotized part of the ductus bursae of *E. enaula* is different from the short respective part of the species of *E. leucofrons* and *E. stramineola* complexes. This species is also externally similar to some Palearctic species, most like *E. alpinella* Stainton, 1854, *E. krogeri* Svensson, 1976 and *E. sobiella* Kaila, sp. n. The genitalia are diagnostic: the male valva is broader than in the other species; the distal cornutus is irregular in its form, not horn-shaped as in the other species (if present); the cornuti are similarly variable as in *E. krogeri* which has narrower valva and a very broad gnathos. The female genitalia are most similar to those of *E. kilmunella* Stainton, 1849, *E. leifi* Kaila & Kerppola, 1992, *E. excelsicola* Braun, 1948 and *E. zernyi* Hartig, 1941. Externally *E. kilmunella* and *E. leifi* differ from the other species in having distally white fringe scales at forewing termen, *E. excelsicola* is more unicolorous, and *E. zernyi* is more narrow-winged with typical zig-zag-shaped outer fascia that is formed of medially confluent costal and tornal spots. The female genitalia of *E. enaula* differ from *E. kilmunella* and *E. excelsicola* by the narrower ostium bursae and significantly shorter sclerotized part of the ductus bursae; it is less than twice as long as apophyses posteriores in *E. enaula*, and nearly three times as long as apophyses posteriores in *E. kilmunella* and *E. excelsicola*. The antrum is deep wine glass-shaped in *E. zernyi*, very short in *E. enaula* (cf. TRAUGOTT-OLSEN & NIELSEN, 1977 where *E. zernyi* is called *E. ingvarella*, and KAILA, 1999b).

Description of male: Forewing length 4.8-5.2 mm. Labial palpus ascending, 1.2 times as long as diameter of head, grey above, dark grey below. Head, neck tuft, tegula, thorax, scape and pedicel shiny grey; flagellum grey. Femur, tibia and tarsal articles of fore and mid legs leaden grey, with white distal rings. Hind leg basally and distally ochreous white, medially grey, tarsal articles ochreous white. Forewing ground colour formed of basally leaden grey and distally dark grey scales making a mottled dark grey appearance; with three indistinct pale yellowish grey markings: medially outward angled fascia from costa to fold at 1/3 of wing length, costal spot near apex, and similar tornal spot situated more basally near apex of dorsal margin. Fringe scales grey. Underside of forewing and both sides of hindwing dark grey with concolorous fringe. Female otherwise as male but forewing markings more contrasted: base of dorsal margin of forewing with white patch; fascia white, outwardly angled, not extended to dorsal margin; costal and tornal spots white.

Male genitalia: Uncus lobes relatively large, shape varying from rounded to somewhat narrow, median margin straight, lateral and distal margin evenly curved; separated from each other by a broad U-shaped incision. Spinose knob of gnathos rounded, of average size within *E. bifasciella* group. Valva basally narrow, medially broadened so that distal half broad, somewhat bent, basal fold of costa extended to distal 3/4 of valva where it meets distal lobe and forms broad hump, sacculus medially slightly truncate and angled, distally straight, meeting cucullus at an obtuse angle. Digitate process 1/4 as long as valva, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at an obtuse angle, distal margin medially somewhat produced, setose. Vinculum gradually tapered into short and broad saccus, median ridge indistinct. Phallus about as long as valva, straight, broadest basally, gradually tapered towards indistinctly bifurcate apex; vesica with two small cornuti: one horn-shaped at middle of phallus, another near apex, of irregular shape, variably dentate; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Apophyses nearly straight, slender, apophyses posteriores slightly longer than apophyses anteriores. Ostium bursae deeply incised in sternum 7, narrow and U-shaped, occupying about 1/3 of the distance between apophyses anteriores, dorsal wall covered by minute spines; antrum small, slightly broader than long. Colliculum narrow, distinctly sclerotized, occupying nearly entirely the caudal part of ductus bursae, 1.5 times as long as apophyses posteriores; ductus seminalis incepted near middle of ductus bursae including antrum, basally dilated; anterior part of ductus bursae membranous, abruptly incepted into lateroposterior part of corpus bursae. Corpus bursae oval, with small internal granules. Signum large, boomerang-shaped, broadest in the middle, margins dentate laterally.

Biology: Unknown. The type series has been collected on a steep slope with rich meadow vegetation (T. Tammaru, personal communication).

Distribution: Only known from the type locality in East Siberia, Russia.

Remarks: This species is referred to as *Elachista* sp. 08MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is *E. humilis* Zeller (distance 3.62 %), which is, however, morphologically distinctive.

***Elachista gravasta* Kaila, sp. n.** (Figs. 13, 37)

Holotype ♂, Russia, S. Ural., Cheliabinsk district., Miass, Ilmen State Res., 24-VI-1997, K. Nupponen & J. Junnilainen leg., L. Kaila prep. 3486, DNA sample 22599 Lepid. Phyl., coll. Nupponen.

Diagnosis: *Elachista gravasta* is externally close to *E. elegans* Frey, 1859 and *E. deriventa* Kaila & Mutanen, 2008, as having distinctive wing pattern in dark grey ground colour, and grey head; see KAILA *et al.* (2008) for diagnosis of *E. elegans* and *E. deriventa*. From *E. deriventa* it can readily be distinguished by the absence of the white basal patch. Both *E. elegans* and *E. deriventa* have a unicolorous, yet mottled dark grey forewing ground colour; this is more irregular in *E. gravasta*, which has an irregular white pattern along median area of the forewing between the fascia and the costal and tornal spots. In the male genitalia, the phallus is wider in *E. deriventa* than in *E. elegans* and *E. gravasta*. Both *E. elegans* and *E. deriventa* have two distinctive cornuti, while *E. gravasta* only has one small one. The uncus lobes are more widely apart from each other in *E. elegans* than in *E. deriventa* and *E. gravasta*.

Description: Forewing length 3 mm. Labial palpus ascending, 1.2 times as long as diameter of head, leaden grey. Head, neck tuft, tegula, thorax, scape and pedicel leaden grey; flagellum grey. Fore leg dark grey, segments and tarsal articles distally leaden grey. Forewing ground colour dark grey, intermixed with white broadly along fold; with two white markings: nearly straight fascia across wing before middle, white costal spot near apex and similar tornal spot situated more basally near apex of dorsal margin, these spots confluent forming angled outer fascia. Fringe dark grey. Both upper and underside of hindwing dark grey, with concolorous fringe.

Male genitalia: Uncus lobes about 1.5 times as long as wide, separated from each other by rather broad V-shaped incision; median margin somewhat concave, lateral and distal margin evenly curved. Spinose knob of gnathos small, rounded. Valva shape average for *E. bifasciella* group, nearly straight, parallel-sided, basal fold of costa extended to distal 3/4 of valva where it meets distal lobe and forms broad, indistinct hump, sacculus basally slightly truncate, distally straight, with a small distal spine. Digitate process 1/4 as long as valva, narrow, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin without an angle, distal margin rounded, setose. Vinculum narrow, gradually tapered into short saccus, without distinct median ridge. Phallus almost 4/5 as long as valva, narrow, weakly bent as s-shaped, with one indistinct horn-shaped cornutus near middle of the length of phallus. Caecum distinctive, basal opening of phallus dorsally projected.

Female genitalia: Unknown.

Biology: Unknown.

Distribution: Only known from the type locality in southern Urals, Russia.

Remarks: This species is referred to as *Elachista* sp. 16MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is *E. elegans* Frey (distance 4.94 %). This affinity is also supported by morphology.

***Elachista clivella* Kaila, sp. n.** (Figs. 14, 38)

Holotype ♂, Russia, 50° 14-16' N 87° 50-55' E, Altai Mts, Kuraiskaja step, 1500-1700 m, 25-VI-2000 T. & K. Nupponen leg., L. Kaila prep. 3342, DNA sample 20892 Lepid. Phyl., coll. Nupponen.

Diagnosis: Externally *Elachista clivella* resembles most *E. herrichii* Frey, 1859, which is, however, grey rather than brown (see TRAUGOTT-OLSEN & NIELSEN, 1977, where *E. herrichii* is

called *E. reuttiana*). The male antenna of *E. herrichii* is unicolorous grey, annulated with white in *E. clivella*. In the male genitalia the shape of the uncus lobes is diagnostic as being more elongate in *E. herrichii* than in *E. clivella*. The cornuti of *E. clivella* are of equal size, the basal cornutus is significantly larger than the distal one in *E. herrichii*.

Description: Forewing length 3.8 mm. Labial palpus ascending, 1.2 times as long as diameter of head, dirty white, somewhat fuscous below. Head, neck tuft, tegula and thorax dirty white; scape, pedicel and flagellum of antenna grey, flagellum distinctly annulated with nearly white rings. Femur, tibia and tarsal articles of fore and mid legs grey, with white distal rings. Hind leg grey laterally, otherwise pale grey, with pale distal ring in tibia and tarsal articles, spurs somewhat darker grey. Forewing ground colour pale brown, mottled by darker greyish brown tips of scales; white, somewhat oblique fascia across wing in the middle, white costal spot near apex, and similar tornal spot situated more basally near apex of dorsal margin. Fringe scales dirty white, brown-tipped. Underside of forewing and both sides of hindwing grey with concolorous fringe.

Male genitalia: Uncus lobes large, rounded, median margin straight, distal and lateral margin evenly curved, uncus lobes separated from each other by narrow V-shaped incision. Spinose knob of gnathos rounded, rather small. Valva parallel-sided, almost straight, basal fold of costa extended to distal 3/4 of valva where it meets distal lobe and forms narrow and distinct, triangular hump; sacculus slightly truncated medially, with minute distal spine, meeting cucullus at a right angle; termen of cucullus straight. Digitate process 1/4 as long as valva, broad, tongue-shaped, with a few setae distally. Juxta lobes basally long, fused, mesial margin straight, meeting distal margin without an angle, distal margin rounded, lobes broadly setose. Vinculum narrow, gradually tapered into long and narrow saccus, with median ridge. Phallus as long as valva, bent at lateral projection, rather broad, basal third broadest, otherwise narrower, parallel-sided, apex straight-cut; vesica with two large cornuti of equal size that are somewhat curved, horn-shaped; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Unknown.

Remarks: This species is referred to as *Elachista* sp. 10MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is *E. herrichii* Frey (distance 3.78 %). This affinity is also supported by morphology.

***Elachista epemba* Kaila, sp. n. (Figs. 15, 16, 39, 57)**

Holotype ♂, Russia, 50° 16-20' N 87° 50-55' E, Altai Mts, Kuraisky hrebet, 2000-2500 m, 27-VI-2000, T. & K. Nupponen leg., L. Kaila prep. 5667, DNA sample 20880 Lepid. Phyl., coll. Nupponen; paratypes 3 ♂♂, 1 ♀, from the same locality as the holotype, altitude 2300 m, 1 ♂, 1 ♀, 7-VII-2001, 1 ♂, 8-VII-2001, 1 ♂, 11-VII-2001, all K. Nupponen leg.; L. Kaila prep. 5672, 5668; DNA samples 20893, 20894, 20967, 20972 Lepid. Phyl., coll. Nupponen, 1 ♂ in coll. MZH.

Diagnosis: *Elachista epemba* is externally close to *E. tuba* Kaila, sp. n. with which it co-occurs; the male of *E. epemba* is somewhat more distinctly marked than *E. tuba*. Their females are similar and their identification requires the study of the genitalia. The female genitalia of these species are readily separated by the shape of the ostium, antrum and the ductus seminalis: the ostium bursae is at posterior margin of sternum 7 in *E. tuba*, deeply incised in S7 in *E. epemba*; the antrum of *E. tuba* is barrel-shaped with prominent spines on its dorsal wall, and its ductus bursae is broad and weakly sclerotized between the antrum and the inception of the ductus seminalis; its anterior part is incepted to the elongate corpus bursae without a distinct limit. The antrum of *E. epemba* is short, bowl-shaped, the ductus bursae is narrow and sclerotized between the antrum and the inception point of the ductus seminalis, and the anterior part of the ductus bursae is abruptly incepted in the corpus bursae. The male genitalia of *E. tuba* and *E. epemba* are readily distinguished by the much larger uncus lobes and the bifurcate apex of phallus in *E. tuba*; the uncus lobes of *E. epemba* are much smaller and the apex of its phallus is not bifurcate.

Description: Forewing length 3.8-4.8 mm. Male: Labial palpus ascending, 1.2 times as long as diameter of head, above pale grey, base of third segment dark grey, below mottled dark grey, apex of

second segment paler grey. Head, neck tuft, tegula, thorax and antenna leaden grey, scales of body mottled by dark grey tipped scales to varying extent. Legs dark grey, tarsal articles with white distal rings; hind tibia somewhat paler, with large pale ochreous patch medially, spurs of hind tibia pale ochreous. Forewing ground colour formed of basally leaden and distally dark grey scales giving a somewhat mottled appearance, darkness of forewing ground colour to some extent variable; white, nearly straight fascia across wing in the middle, white costal spot near apex, and similar tornal spot situated more basally near apex of dorsal margin. Fringe scales concolorous with forewing ground colour. Underside of forewing and both sides of hindwing grey or dark grey, with concolorous fringe.

Female: Otherwise as male, but scales of head, neck tuft and thorax basally leaden grey and distally dark grey making strongly mottled appearance; flagellum annulated with leaden grey distal rings; forewing ground colour darker grey than in male, white markings more pronounced.

Male genitalia: Uncus lobes rather small, 1.5 times as long as wide, median margin straight, distal and lateral margin evenly curved; separated from each other by broad U-shaped incision. Spinose knob of gnathos rounded, of average size in the *E. bifasciella* group. Valva widened in distal half, straight, basal fold of costa extended to distal 3/4 of valva where meets distal lobe and forms narrow and distinct, triangular hump; cucullus slightly truncated medially, with minute distal spine, meeting cucullus at a right angle; termen of cucullus straight. Digitate process 1/4 as long as valva, parallel-sided, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin without an angle, distal margin rounded, lobes broadly setose. Vinculum narrow, gradually tapered, with no distinct saccus or distinct median ridge. Phallus 4/5 as long as valva, almost straight, rather narrow, parallel-sided, apex straight-cut; vesica with two large cornuti; the basal somewhat curved, horn-shaped, the distal one more irregularly-shaped; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Apophyses nearly straight, slender; apophyses posteriores a little longer than papillae anales, apophyses anteriores as long as apophyses posteriores. Ostium bursae deeply incised in posterior margin of sternum 7, occupying about 1/4 of the distance between apophyses anteriores; antrum bowl-shaped, twice as broad as long. Colliculum narrow, distinctly sclerotized, twice as long as apophyses posteriores; ductus seminalis incepted at middle of ductus bursae including antrum, without basal dilation; a few sclerotized teeth in ductus bursae near inception of ductus seminalis; anterior part of ductus bursae somewhat broader than posterior part, membranous, abruptly incepted in corpus bursae. Corpus bursae rounded, with minute internal granules. Signum large, elongate, boomerang-shaped, dentate.

Biology: Unknown.

Distribution: Only known from the type locality in Altai Mts.

Remarks: This species is referred to as *Elachista* sp. 11MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is the morphologically distinctive *E. herrichii* Frey (distance 4.44 %).

***Elachista diodia* Kaila sp. n. (Figs. 17, 40, 41)**

Holotype ♂, Russia, Polar Ural, 67° 02' N 65° 05' E, Europe Asia Pass, dry tundra, 300 m, 4-VII-1994, Jalava, Koponen & Kullberg leg., L. Kaila prep. 4855, DNA sample 16145 Lepid. Phyl., coll. MZH; paratype 1 ♂, with the same collecting data; L. Kaila prep. 1208, DNA sample 16146 Lepid. Phyl., coll. MZH.

Diagnosis: *Elachista diodia* is a relatively small and narrow-winged species of the *E. bifasciella* group. It is shiny pale grey, with costal and tornal spots opposite each other as the only pattern, as in *E. humilis* Zeller, 1850 which is, however, almost black. The appearance of *E. diodia* is similar to *E. irenae* Buszko, 1989 which is only known from Tatra mts., and also *E. talgarella* Kaila, 1992, known from Tien-Shan Mts. (Kazakhstan). *E. talgarella* has, however, darker forewing ground colour with brighter pattern than *E. diodia* or *E. humilis* (TRAUGOTT-OLSEN & NIELSEN, 1977, KAILA, 1992). The male genitalia of *E. diodia* are characteristic with a combination of the very large uncus lobes and the very small spinose knob of the gnathos. The tegumen of both *E. irenae* and *E. talgarella* is broader than in most *Elachista* species.

Description: Forewing length 4 mm. Labial palpus ascending, 1.2 times as long as diameter of head, white above except base and tip of third segment grey, underside grey. Head, neck tuft, tegula, scape and pedicel shiny grey, flagellum grey, weakly annulated by paler grey rings. Fore and mid leg outwardly dark grey, tibia and tarsal articles pale; hind leg outwardly grey, tibia and tarsal articles paler grey. Forewing shiny grey, scales along costa and towards apex more pronouncedly so with paler base and darker apex; near apex indistinctly delimited, outward angled costal spot and similar tornal spot that are medially confluent forming indistinctly limited, medially outward angled pale fascia; no other pattern discernible. Broad fringe scales dark grey-tipped, narrow fringe scales grey. Underside of forewing and both sides of hindwing grey with concolorous fringe.

Male genitalia: Uncus lobes very large, median margin straight, lateral and distal margin evenly curved; separated from each other by V-shaped incision. Spinose knob of gnathos slightly longer than wide, very small. Valva relatively broad, parallel-sided, somewhat bent, basal fold of costa extended to distal 3/4 of valva where meets distal lobe and forms narrow and distinct hump; sacculus distally bent, without distal spine, meeting cucullus without an angle. Digitate process 1/4 as long as valva, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at a right angle, distal margin slightly rounded, setose. Vinculum tapered into short and narrow saccus, median ridge indistinct. Phallus 4/5 as long as valva, straight, broadest basally, gradually tapered towards bifurcate apex; vesica with none to two cornuti: when present, one very small and horn-shaped at middle of phallus, another as dentate plate nearer apex; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Unknown.

Biology: The specimens have been collected by net on dry tundra habitat.

Distribution: Only known from the type locality in northern Urals, Russia.

Remarks: This species is referred to as *Elachista* sp. 02MM in MUTANEN *et al.* (2013). Of the species included in that work the closest taxon in terms of similarity of barcodes is the morphologically very different *E. wieseriella* Huemer (distance 2.02 %) (cf. HUEMER, 2000).

***Elachista tephрина* Kaila, sp. n.** (Figs. 18, 44, 45)

Holotype ♂: [USSR] Kirgisia, [Kyrgyzstan], 41° 26' N 76° 29' E, 41 km E Naryn, 2900 m, *Picea*/steppe, 7-VIII-1990 L. Kaila leg., L. Kaila prep. 418, DNA sample 22532 Lepid. Phyl., coll. MZH; paratypes 5 ♂♂, 4 ♀♀, with the same collecting data as in the holotype, but dates 4-7-VIII-1990, L. Kaila prep. 417, 436, 437, 438, DNA samples 22533, 22534, 22541 Lepid. Phyl., coll. MZH, Kyrgyzstan, Tien-Shan Mts, 2600 m, Eki-Naryn, 1 ♂, 5-VIII-2010, K. Nupponen leg., L. Kaila prep. 5678, DNA sample 22541 Lepid. Phyl., coll. Nupponen.

Diagnosis: *Elachista tephрина* is a close relative of *E. subnigrella* Douglas, 1853 and *E. tuba* sp. n. It is a small species, thus readily externally different from the considerably larger *E. tuba*. The known distribution for *E. subnigrella* extends from Central Europe to the Ural mts., that of *E. tephрина* only to the Naryn region in Tien-Shan mts., and that of *E. tuba* the Altai and Sajan mts. These three taxa appear, thus, allopatric, so the collecting site may give a hint for the identification, though with some caution as the general knowledge of the distribution range of *Elachista* species is still incomplete. Apart from the larger size of *E. tuba* as compared to *E. subnigrella* and *E. tephрина*, these three species can be distinguished as follows: the male valva is most bent and distally distinctly widened in *E. subnigrella* (Figs. 42, 43), in general narrower and not or only moderately widened, and less bent in *E. tuba* and *E. tephрина*. The cornutus, which is often divided into two smaller ones, is larger in *E. tuba* than in the other species. The uncus lobes are larger in *E. subnigrella* than in the other species. This character, together with the slenderer valva differentiates *E. tephрина* from *E. subnigrella*. The female genitalia of *E. tephрина* are unknown.

Description: Forewing length 3.5 mm. Labial palpus ascending, approximately 1.2 times as long as diameter of head, white above, segments largely fuscous below. Clypeus leaden grey, frons and neck tuft coloured by basally grey and distally dark grey scales. Scape grey with white distal patch, pedicel

and flagellum unicolorous grey, sometimes weakly annulated by slightly paler rings. Tegula and thorax grey, sometimes intermixed with paler grey scales. Fore and mid leg dark grey, with white distal ring in tibia and tarsal articles. Hind leg grey, with pale distal ring in tibia and tarsal articles. Forewing ground formed of basally white and distally dark grey scales giving a strongly mottled appearance, transverse slightly paler fascia sometimes traceable in the middle of wing length; beyond it between fold and dorsum sometimes somewhat darker grey, elongate patch; costal spot sometimes a little more distinct, near apex, dorsal spot barely decipherable, a little more basally situated than costal spot. Fringe concolorous with ground colour. Underside dark grey, fringe scales concolorous. Hindwing grey both above and below, with concolorous fringe.

Male genitalia: Uncus lobes large, laterally produced, median margin somewhat convex, distal margin evenly curved, lateral margin basally nearly straight making the uncus lobe to be broadest basally; separated from each other by V-shaped incision. Spinose knob of gnathos rounded, of average size in the *E. bifasciella* group. Valva basally narrow, broadened towards apex, distinctly bent, basal fold of costa extended to distal 2/3 of valva where it meets distal lobe and forms distinct hump; sacculus evenly bent, without distal spine, meeting the rounded cucullus without an angle. Digitate process 1/4 as long as valva, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at a right angle, distal margin slightly rounded, setose. Vinculum gradually tapered into broad saccus, with distinct median ridge. Phallus 4/5 the length of valva, bent at lateral projection, straight at ventral projection, basal third broadest, otherwise narrower, parallel-sided, apex distinctly bifurcate; vesica with one distinct cornutus that is straight, horn-shaped; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Unknown.

Biology: Specimens have been caught in active flight before sunset at openings of spruce forest with rich understorey vegetation. Immature stages are unknown.

Distribution: Only known from Naryn region in Kyrgyzstan.

Remarks: This species is referred to as *Elachista* sp. 13MM in MUTANEN *et al.* (2013). *E. tephрина* was reported as *E. subnigrella* from Kyrgyzstan by KAILA (1992). *E. subnigrella* is also the closest taxon in terms of similarity of barcodes in MUTANEN *et al.* (2013) (distance 1.87 %). This level of divergence suggests a close relationship between these, also morphologically similar species.

***Elachista tuba* Kaila, sp. n.** (Figs. 19, 20, 46, 47, 58)

Holotype ♂, USSR [Russia], SW Altai, Katun Valley, 10 km W Katanda, 1200 m, 15-19-VII-1983, Exp. Mikkola, Hippa & Jalava leg., L. Kaila prep. 2089, coll. MZH; paratypes 16 ♂♂, 4 ♀♀; 1 ♂ with the same collecting data as in holotype except the date 6-9-VI-1983, L. Kaila prep. 4805, coll. MZH; Russia Novosibirsk, Akademgorodok, 2 ♂♂, 4-VI-1988, 2 ♂♂, 29-V-1989, V. V. Dubatolov leg., L. Kaila prep. 2079, 2081, 4014, coll. SZMN; Altai mts., 51° 00-10' N 85° 35' E, Sarlyk region, 1400-1500 m, 1 ♂, 2000 m, 1 ♂ 24-VI-2000, T. & K. Nupponen leg., L. Kaila prep. 3224, 5607, DNA samples 20878, 20886 Lepid. Phyl., coll. Nupponen; Altai mts., 50° 16-20' N 87° 50-55' E, Kuraisky hrebet, 2300 m, 7 ♂♂, 4 ♀♀, 6-13-VII-2001, K. Nupponen leg., L. Kaila prep. 5603, 5604, 5608, 5671, DNA samples 20968, 20969, 20971, 20974, 21468, 21470, 21471, 21472, 21474, 21475 Lepid. Phyl., coll. Nupponen, 1 ♂, 1 ♀ in coll. MZH, Tuva rep. 50° 50' N 94° 19' E, 2175 m, E. Tannu-Ola mts, timberline (*Larix*) / steppe, 2 ♂♂, 17-VI-1995, J. Jalava & J. Kullberg leg., L. Kaila prep. 1840, 1834, DNA samples 22535, 22536 Lepid. Phyl., coll. MZH.

Diagnosis: *Elachista tuba* is a close relative of *E. subnigrella* Douglas, 1853 and *E. tephрина* Kaila, sp. n. It is distinctly larger than either of these species, and similar to *E. epemba* Kaila, sp. n. with which it co-occurs. *E. epemba* male is, however, more distinctly marked. Their females are similar and their identification requires the study of the genitalia (for their identification, see the diagnosis of *E. epemba*). As in *E. subnigrella*, the female genitalia of *E. tuba* are characterized by the large, elongate antrum and the very coarse setae on the dorsal wall of the ostium bursae. The male of *E. tuba* is indistinctly marked, nearly unicolorous grey. The male genitalia closely resemble those of *E.*

subnigrella and *E. tephрина*. Their separation is explained in the diagnosis of *E. tephрина*. In the female genitalia the base of the ductus seminalis is distinctly dilated in *E. subnigrella*, not so in *E. tuba*. The inception point of ductus seminalis is closer to the ostium bursae in *E. tuba* than in *E. subnigrella*; the ratio of antrum + ductus bursae to the inception of ductus seminalis vs. the remaining part of ductus bursae + corpus bursae is approximately 0.3 in *E. tuba*, 0.5 in *E. subnigrella*. The female genitalia of *E. tephрина* are unknown.

Description of male: Forewing length 4.8-5.5 mm. Labial palpus ascending, approximately 1.2 times as long as diameter of head, white above, segments largely fuscous below. Clypeus dirty white, frons and neck tuft coloured by basally dirty white and distally dark grey scales. Scape variably grey above, otherwise white; pedicel and flagellum unicolorous grey. Tegula and thorax grey, intermixed with white scales. Fore and mid leg dark grey, with white distal ring in tibia and tarsal articles. Hind leg grey, with pale distal ring in tibia and tarsal articles. Forewing ground formed of basally white and distally dark grey scales giving a strongly mottled appearance, transverse, slightly paler fascia sometimes traceable in the middle of wing length; beyond it between fold and dorsum sometimes somewhat darker grey, elongate patch costal spot often a little more distinct, near apex, dorsal spot barely decipherable, a little more basally situated than costal spot. Fringe concolorous with ground colour. Underside dark grey, fringe scales basally ochreous, distally grey. Hindwing grey both above and below, with concolorous fringe.

Description of female: Wingspan 3.8-4.5 mm. Otherwise as male, but flagellum black, broadly annulated with leaden grey; forewing ground colour black with bright white markings: somewhat outwardly bent fascia in the middle of wing length, triangular costal spot near apex, and slightly more basally situated similar tornal spot.

Male genitalia: Uncus lobes large, laterally produced, median margin somewhat convex, distal margin evenly curved, lateral margin basally nearly straight making the uncus lobe to be broadest basally; separated from each other by V-shaped incision. Spinose knob of gnathos rounded, of average size in the *E. bifasciella* group. Valva basally narrow, somewhat broadened towards apex, distinctly bent, basal fold of costa extended to distal 2/3 of valva where meets distal lobe and forms very indistinct hump; sacculus evenly bent, without distal spine, meeting the rounded cucullus without an angle. Digitate process 1/4 as long as valva, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at a right angle, distal margin slightly rounded, setose. Vinculum tapered into long and narrow saccus, with distinct median ridge. Phallus 4/5 the length of valva, bent at lateral projection, straight at ventral projection, basal third broadest, otherwise narrower, parallel-sided, apex distinctly bifurcate; vesica with one or two distinct cornuti: the basal one horn-shaped, straight and prominent, the distal one, when present, smaller, also horn-shaped; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Apophyses nearly straight, apophyses posteriores stout, apophyses anteriores slender, the length of apophyses posteriores about as long as that of apophyses anteriores. Ostium bursae at posterior margin of sternum 7, occupying about 1/3 of the distance between apophyses anteriores, dorsal wall densely covered by coarse spines; antrum laterally convex, approximately twice as long as broad. Colliculum broad, indistinctly sclerotized, 1.5 times as long as apophyses posteriores; ductus seminalis incepted near middle of ductus bursae including antrum, without basal dilation; anterior part of ductus bursae broad, membranous, incepted in corpus bursae without distinct limit. Corpus bursae elongate, with minute internal granules. Signum boomerang-shaped, broadest in the middle, margins dentate laterally.

Biology: Unknown.

Distribution: Widespread and apparently fairly common in steppe habitats of southern Siberia; recorded from Novosibirsk region, Altai and Tannu-Ola mountains, with a wide range of elevation.

Remarks: This species is referred to as *Elachista* sp. 12MM in MUTANEN *et al.* (2013). *E. subnigrella* is the closest taxon in terms of similarity of barcodes in MUTANEN *et al.* (2013) (distance 1.24 %). This level of divergence suggests a close relationship between these, also morphologically similar species.

***Elachista austera* Kaila, sp. n.** (Figs. 21, 22, 48, 49, 62)

Holotype ♂, Turkey, Sultan Daglari, 30 km W Aksehir, 1200 m, 6-V-1996, L. Kaila prep. 3017, DNA sample 15492 Lepid. Phyl., coll. Nupponen; paratypes 13 ♂♂, 1 ♀, Turkey, Sultan Daglari, 25 km SW Aksehir, 1500 m, 1 ♂, 9-VI-2002, T. Nupponen leg., L. Kaila prep. 5624, DNA sample 15493 Lepid. Phyl., coll. Nupponen, Cetince, 35 km SW Aksehir, 1200 m, 4 ♂♂, 9-13-V-2000, 8 ♂♂, 1 ♀, 15-V-2005, J. Junnilainen leg., DNA samples 15494, 22235 Lepid. Phyl., in coll. Junnilainen, 2 ♂♂, 1 ♀ in coll. MZH.

Diagnosis: *Elachista austera* is a fairly large species with grey forewing ground colour and the usual markings, i.e. a fascia near middle of wing length, and a costal and a tornal spot near apex of the forewing. It is otherwise similar to *E. atricomella* Stainton, 1849 but is paler grey. The costal and tornal spots are often medially confluent forming a similar pattern that is typical of *E. zernyi* Hartig, 1941 which is readily distinguishable from *E. austera* by both male and female genitalia: in the male genitalia the apex of phallus is straight-cut, the uncus lobes are evenly rounded, and the cornuti are minute in *E. zernyi*, while the apex of the phallus is bifurcate, at least one cornutus is large, and the uncus lobes are laterally produced in *E. austera* (for genitalia of *E. zernyi*, see TRAUGOTT-OLSEN & NIELSEN 1977, where *E. zernyi* is presented as *E. ingvarella*, and KAILA 1999b). Externally, *E. atricomella*, *E. austera* and *E. vulturna* Kaila, sp. n. differ from each other as follows: the ground colour of the forewing of *E. austera* is grey, nearly black in *E. atricomella* and *E. vulturna*. *E. vulturna* is more stout-bodied and smaller than *E. atricomella* and *E. austera*, and its forewing markings are white or creamy white with some metallic silvery sheen, unlike the other species. In the male genitalia of *E. austera*, *E. vulturna* and *E. atricomella* the intraspecific variation seems to exceed interspecific variation, so it appears that these species cannot be distinguished by male genitalia (for illustration of male genitalia of *E. atricomella*, see TRAUGOTT-OLSEN & NIELSEN, 1977). In the female genitalia the posterior margin of ostium bursae is diagnostic: it is straight in *E. austera*, mesially somewhat curved to posterior direction in *E. atricomella* (Fig. 60), and distinctly curved in *E. vulturna*. The spines on the dorsal wall of the antrum are coarser in *E. vulturna* than in *E. atricomella*.

Description: Forewing length 5-6 mm. Labial palpus ascending, 1.2 times as long as diameter of head, white above, below segments variably fuscous or powdered with dark grey scales except tips of segments that are white. Scales of head, neck tuft, tegula, thorax, scape and pedicel pale grey, dark grey tipped; flagellum grey, in female somewhat annulated with paler rings, most pronouncedly so in basal third. Femur, tibia and tarsal articles of fore and mid legs leaden grey with white distal rings. Hind leg grey laterally, otherwise pale grey, with white distal ring in tibia and tarsal articles. Forewing ground colour formed of basally pale grey and distally dark grey scales making a mottled grey appearance; with three white markings: nearly straight fascia across wing before middle, white costal spot near apex, and similar tornal spot situated more basally near apex of dorsal margin; costal and tornal spots often medially confluent forming a medially narrowed curved fascia; dark grey elongate spot between fold and tornus at middle of wing. Fringe scales dirty white, brown-tipped. Underside of forewing and both sides of hindwing grey with concolorous fringe.

Male genitalia: Uncus lobes large, laterally produced, median margin straight or somewhat convex, distal margin evenly curved, lateral margin basally nearly straight making the uncus lobe to be broadest basally; separated from each other by narrow U-shaped incision. Spinose knob of gnathos rounded, of average size in the *E. bifasciella* group. Valva basally narrow, often slightly broadened towards apex, distinctly bent, basal fold of costa extended to distal 2/3 of valva where it meets distal lobe and forms broad and indistinct hump; sacculus evenly bent, with minute distal spine, meeting the rounded cucullus at a right angle. Digitate process 1/4 as long as valva, broad, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin at a right angle, distal margin mesially slightly concave, laterally slightly convex, setose. Vinculum gradually tapered into broad saccus, without median ridge. Phallus 4/5 the length of valva, bent at lateral projection, straight at ventral projection, basal third broadest, otherwise narrower, parallel-sided, apex distinctly bifurcate; vesica with two distinct cornutus that are straight, horn-shaped, the basal one large, distal one small; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Apophyses nearly straight, rather short and stout; apophyses posteriores as long as apophyses anteriores, shorter than papillae anales. Ostium bursae in posterior margin of sternum 7, wide, its posterior margin straight, laterally continued by narrow, straight sclerotizations; antrum large, deep, bowl-shaped, posteriorly very broad, abruptly tapered and otherwise almost parallel-sided, as long as apophyses and twice as long as its width medially, dorsal wall densely covered by sharp spines. Colliculum broad, distinctly sclerotized, twice as long as antrum; ductus seminalis incepted at middle of ductus bursae including antrum, without basal dilation; a few sclerotized teeth in ductus bursae in posterior side of inception of ductus seminalis; anterior part of ductus bursae broader than posterior part, membranous, abruptly incepted in corpus bursae. Corpus bursae rounded, with minute internal granules. Signum large, elongate, dentate.

Biology: Unknown.

Distribution: Turkey.

Remarks: This species is referred to as *Elachista* sp. 14MM in MUTANEN *et al.* (2013), with a divergence of 1.39 % from *E. atricomella* in the barcode. *E. atricomella* was found to constitute four genetically distinct lineages, three of which also differing in their morphology. Apart from *E. atricomella*, two of the lineages were given a status of putative new species by MUTANEN *et al.* (2013), and are formally described here (*E. austera* and *E. vulturna*). This split rendered *E. atricomella* as polyphyletic, one mitochondrial haplotype occurring in northern and western Europe, the other in Bulgaria, Macedonia and Greece. While incomplete lineage sorting or introgression may result in gene-level para- or polyphyly, we cannot rule out that the south-eastern population might represent a fourth, morphologically indistinguishable species. The study of the morphology of the female, as well as examination of other genetic markers might help in resolving the status of this population. Only one female of this lineage was available to the present author, and its signum is considerably larger than in the other species (Fig. 61). The range of variation remains to be examined to assess the value of this character.

***Elachista vulturna* Kaila, sp. n. (Figs. 23, 24, 50, 51, 63)**

Holotype ♂: Ukraine: Crimea, Karadagh 19-V-1998, Yu. Budashkin leg., L. Kaila prep. 4850, DNA sample 16170 Lepid. Phyl. (MZH). Paratypes 35 ♂♂, 20 ♀♀, from the same locality as the holotype; 1 ♂, 6-VI-1987 Yu. Budashkin leg., coll. MZH; 1 ♂, 21-V-1987, 1 ♂, 1 ♀, 26-V-1987, 1 ♂, 28-V-1987, 1 ♀, 10-VI-1987, 1 ♂, 12-VI-1987, 2 ♀♀, 13-VI-1987, 3 ♂♂, 1 ♀, 15-VI-1987, 2 ♂, 1 ♀, 16-VI-1987, 2 ♀♀, 17-VI-1987, 1 ♂, 19-VI-1987, 2 ♂♂, 1 ♀, 21-VI-1987, 1 ♀, 24-VI-1987, 1 ♂, 25-VI-1987, 1 ♂, 27-VI-1987, 1 ♀, 2-VII-1987, S. Sinev leg. (ZIN), 1 ♂, 26-V-1988, 1 ♀, 27-V-1988, 2 ♂♂, 31-V-1988, 1 ♂, 1-VI-1988, 1 ♂, 3-VI-1988, 3 ♂♂, 6-VI-1988, 1 ♂, 9-VI-1989, 1 ♀, 12-VI-1989, 1 ♂, 29-V-1990, 2 ♂♂, 31-V-1991, 1 ♀, 8-VI-1991, 1 ♂, 13-VI-1988, 1 ♂, 15-VI-1991, 1 ♂, 15-VI-1991, 1 ♀, 28-V-1992, 1 ♂, 29-V-1992, 1 ♀, 5-VI-1992, 1 ♂, 27-IV-1993, 1 ♀, 19-V-1993, 1 ♀, 9-VI-1993, 1 ♂, 1 ♀, 12-V-1994, 1 ♀, 8-V-1996, 1 ♂, 19-V-1996, 1 ♂, 20-V-1996, 1 ♀, 28-V-1996, 1 ♂, 13-VI-1996, all Yu. Budashkin leg., L. Kaila prep. 2087, 4851, 4852, 5661, 5662, 5663; DNA samples 16169, 16171, 16173, 21388, 21391 Lepid. Phyl., coll. MZH.

Diagnosis: *Elachista vulturna* is a small species of the *E. bifasciella* group, with stout body, nearly black forewing ground colour with distinct white or creamy white, somewhat metallic shining pattern. As such, it is quite alike other species in the *E. atricomella* complex. It resembles most perhaps *Elachista adelpha* Kaila & Jalava, 1994, but is more broad-winged. The genitalia of *E. adelpha* are readily separated from those of *E. vulturna* (see KAILA & JALAVA, 1994). The differentiation of *E. vulturna* from *E. austera* and *E. atricomella* is explained under the diagnosis of *E. austera*.

Description: Forewing length 3.5-4 mm. Labial palpus ascending, 1.2 times as long as diameter of head, white above except base and often apex of third segment dark grey, below dark grey. Scales of clypeus pale ochreous white, dark grey tipped, those of frons, neck tuft, tegula, thorax, scape and pedicel leaden grey, dark grey tipped, apex of tegula and caudal end of thorax creamy white; flagellum grey, in female distinctly annulated with creamy white rings. Legs dark grey, segments and tarsal articles distally white, mid and hind tibia with white patch medially. Forewing ground colour dark grey;

base at tornal side with small creamy patch, and with three white markings: nearly straight fascia across wing in fore middle, white costal spot near apex, and similar tornal spot situated more basally near apex of dorsal margin. Broad fringe scales along termen basally grey, with white transverse band, and distally black; narrow fringe scales grey except at costal and tornal spots white. Underside of forewing dark grey, at apical fifth mottled by leaden grey bases of scales; fringe dark grey, traces of costa and tornal spots visible as ochreous bases of scales. Both sides of hindwing grey with concolorous fringe.

Male genitalia: Uncus lobes large, laterally produced, median margin straight or somewhat convex, distal margin evenly curved, lateral margin basally nearly straight making the uncus lobe broadest basally; separated from each other by narrow U-shaped incision. Spinose knob of gnathos rounded, of average size in the *E. bifasciella* group. Valva basally narrow, often slightly broadened towards apex, distinctly bent, basal fold of costa extended to distal 2/3 of valva where meets distal lobe and forms broad and indistinct hump; sacculus evenly bent, with minute distal spine, meeting the rounded cucullus at a right angle. Digitate process 1/4 as long as valva, broad, tongue-shaped, with a few setae distally. Mesial margin of juxta lobes straight, meeting distal margin without an angle, distal margin mesially convex, laterally slightly concave, setose. Vinculum gradually tapered into broad saccus, with median ridge. Phallus 4/5 the length of valva, bent at lateral projection, straight at ventral projection, basal third broadest, otherwise narrower, parallel-sided, apex distinctly bifurcate; vesica with two distinct cornuti that are straight, horn-shaped, the basal one large, the distal small; caecum distinctive, basal opening posteriorly projected.

Female genitalia: Apophyses nearly straight, rather short and stout; apophyses posteriores as long as apophyses anteriores, as long as papillae anales. Ostium bursae in posterior margin of sternum 7, wide, its posterior margin medially distinctly curved, laterally continued by narrow, curved horn-like sclerotizations; antrum large, deep, bowl-shaped, posteriorly very broad, gradually tapered, as long as apophyses and twice as long as its width medially, dorsal wall densely covered by coarse spines. Colliculum broad, distinctly sclerotized, three times as long as antrum; ductus seminalis incepted somewhat anteriorly to middle of ductus bursae including antrum, without basal dilation; a few sclerotized teeth in ductus bursae in anterior side of inception of ductus seminalis; anterior part of ductus bursae broader than posterior part, membranous, abruptly incepted in corpus bursae. Corpus bursae rounded, with minute internal granules. Signum large, rather broad, broadest medially, dentate.

Distribution: Ukraine: Crimea.

Biology: Unknown.

Remarks: The record of *Elachista atricomella* Stainton from Crimea by Budashkin & Sinev (1991) is referable to *E. vulturna* Kaila, sp. n. See also remarks under *E. austera*. *E. vulturna* is referred to as *Elachista* sp. 07MM in MUTANEN *et al.* (2013), with divergence of 1.07 % in the barcode from *E. atricomella*.

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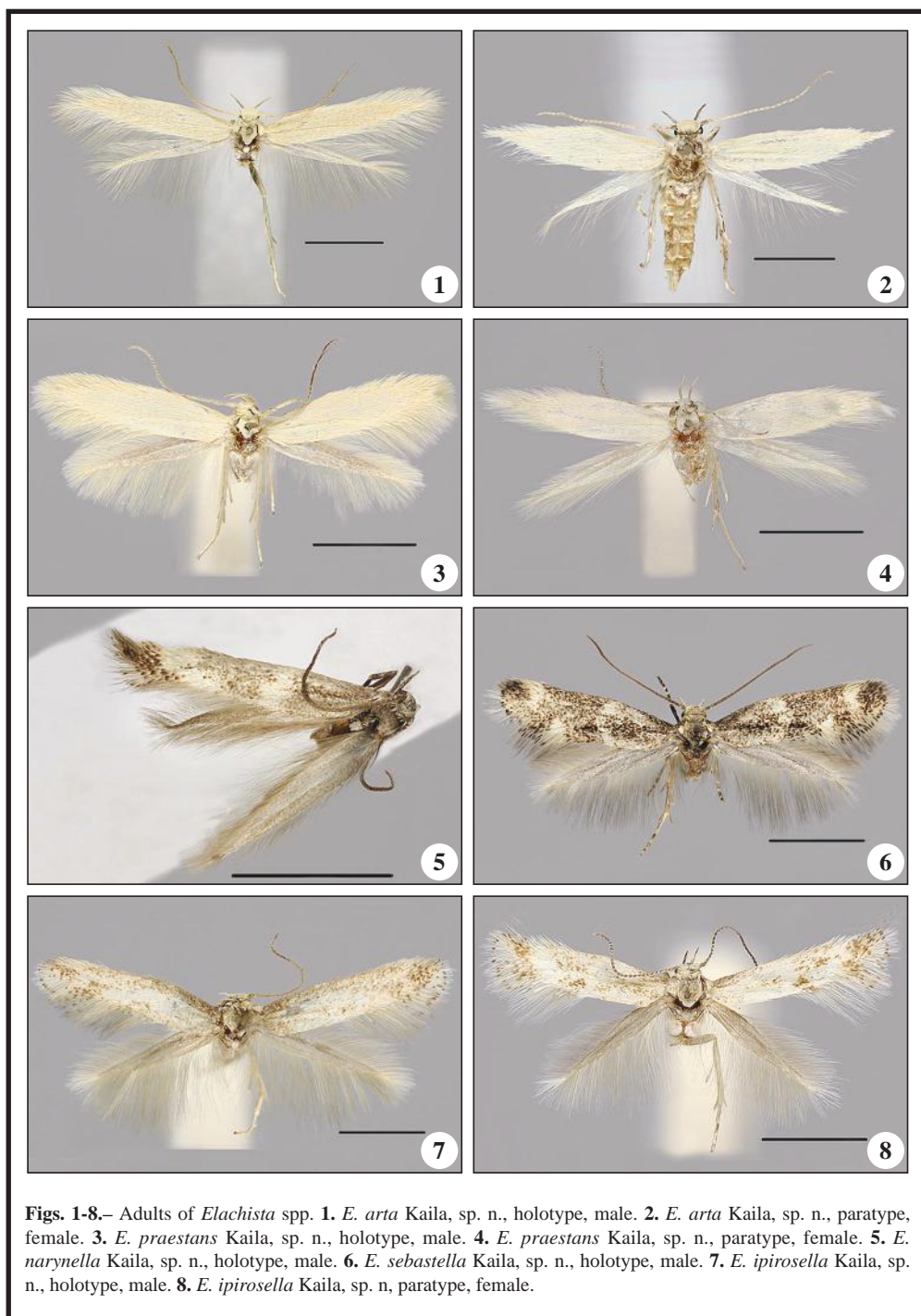
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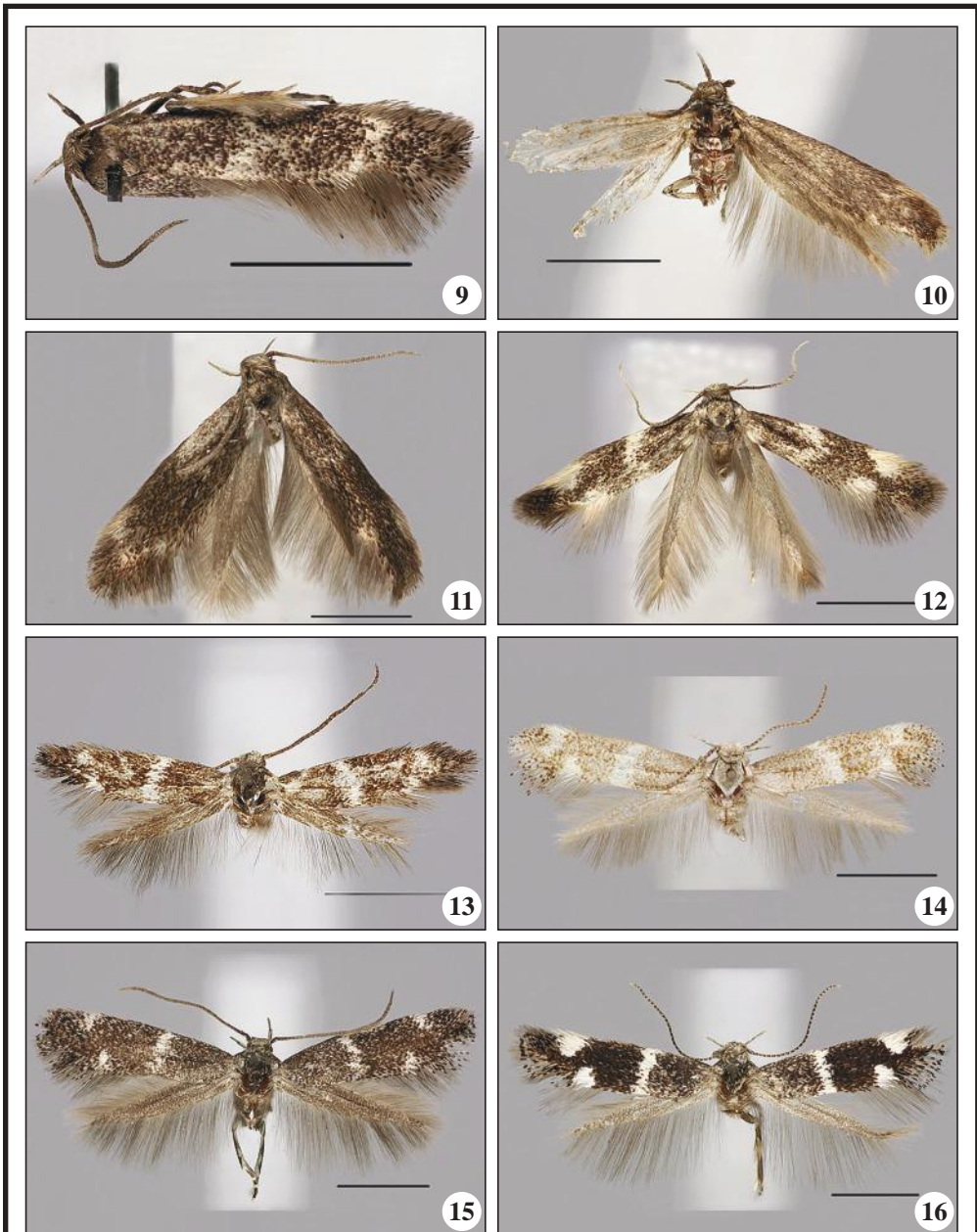
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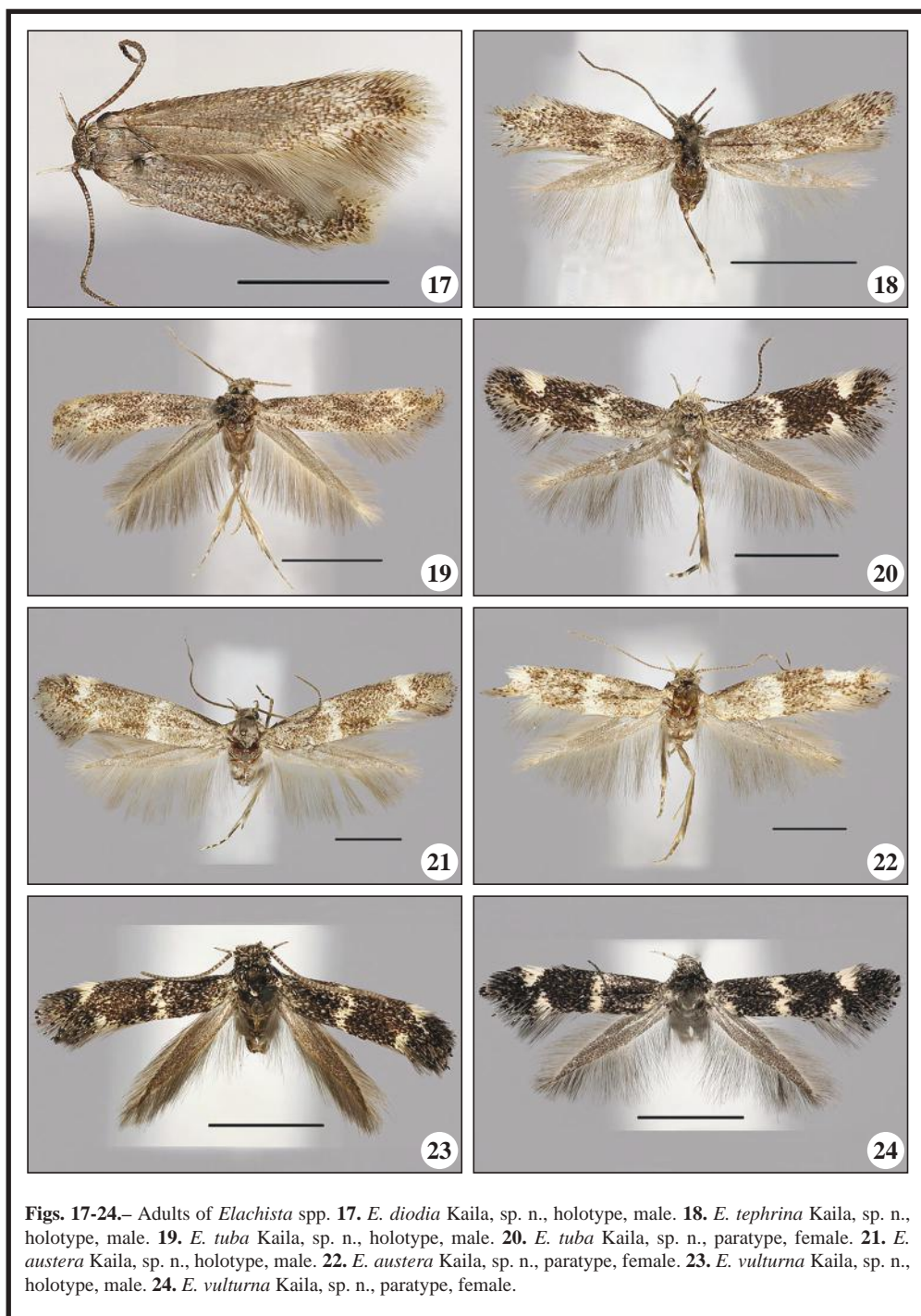
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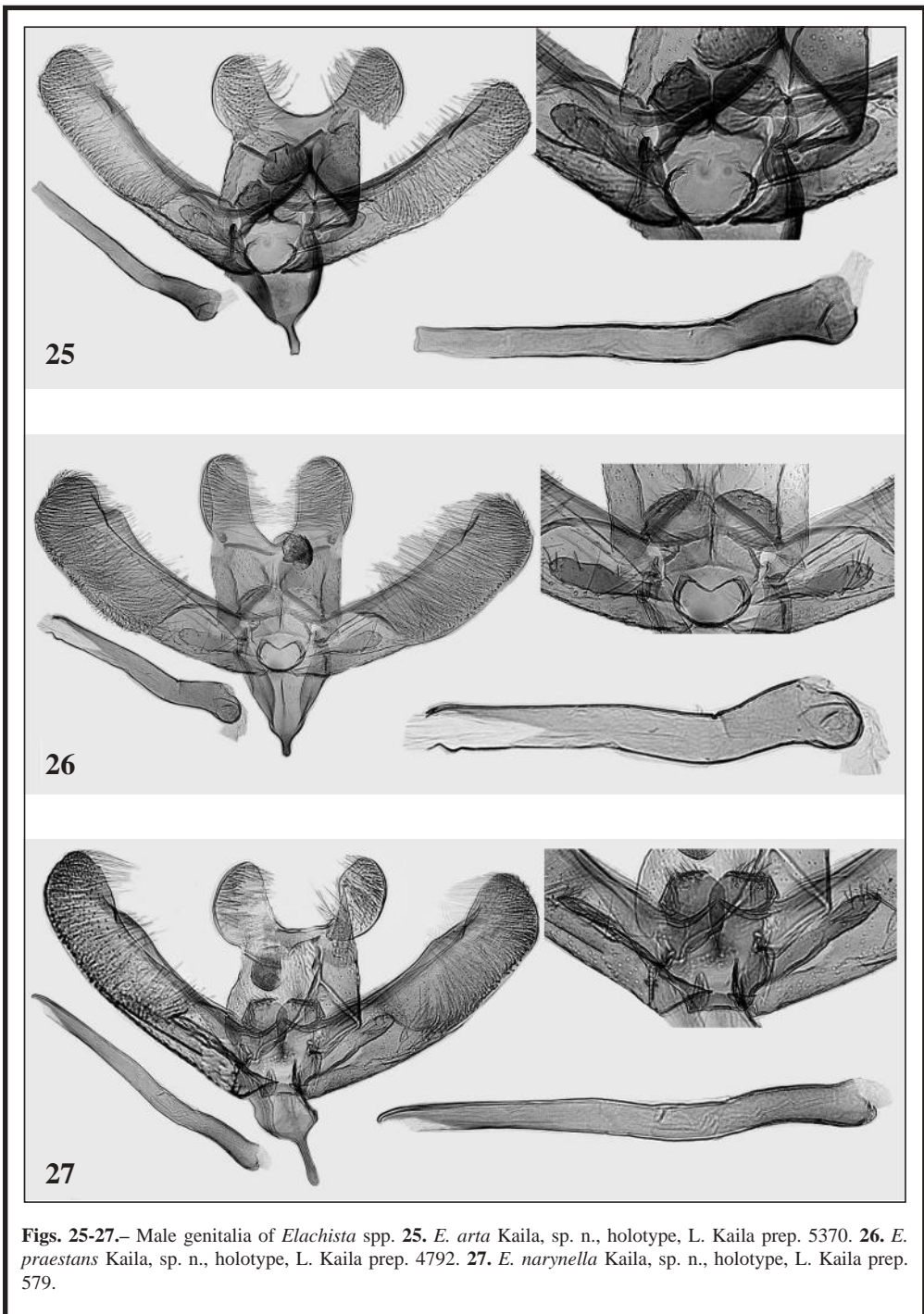
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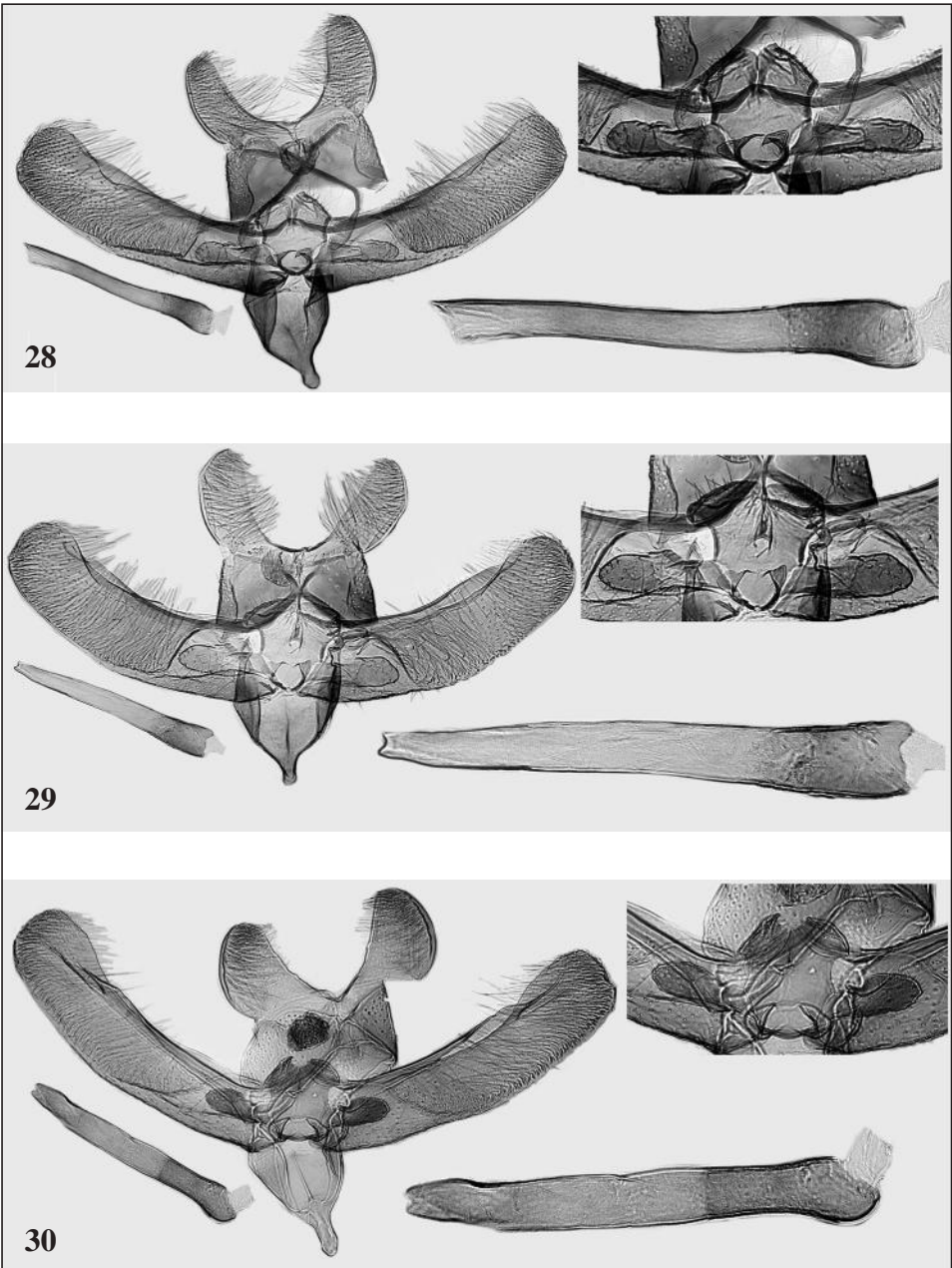




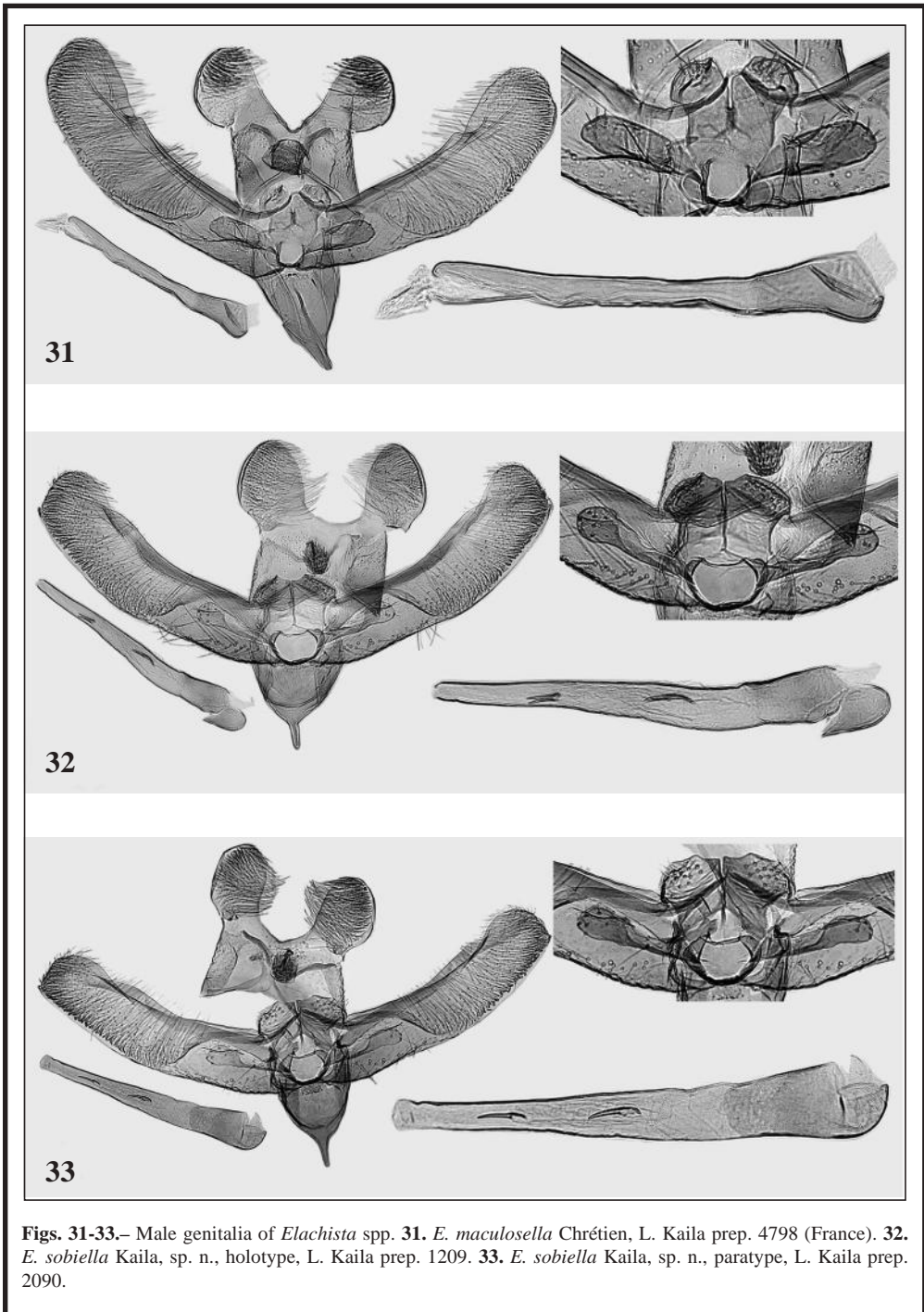
Figs. 9-16.— Adults of *Elachista* spp. **9.** *E. sobiella* Kaila, sp. n., holotype, male. **10.** *E. chukotica* Kaila, sp. n., holotype, male. **11.** *E. enaula* Kaila, sp. n., holotype, male. **12.** *E. enaula* Kaila, sp. n., paratype, female. **13.** *E. gravasta* Kaila, sp. n., holotype, male. **14.** *E. clivella* Kaila, sp. n., holotype, male. **15.** *E. epemba* Kaila, sp. n., holotype, male. **16.** *E. epemba* Kaila, sp. n., paratype, female.

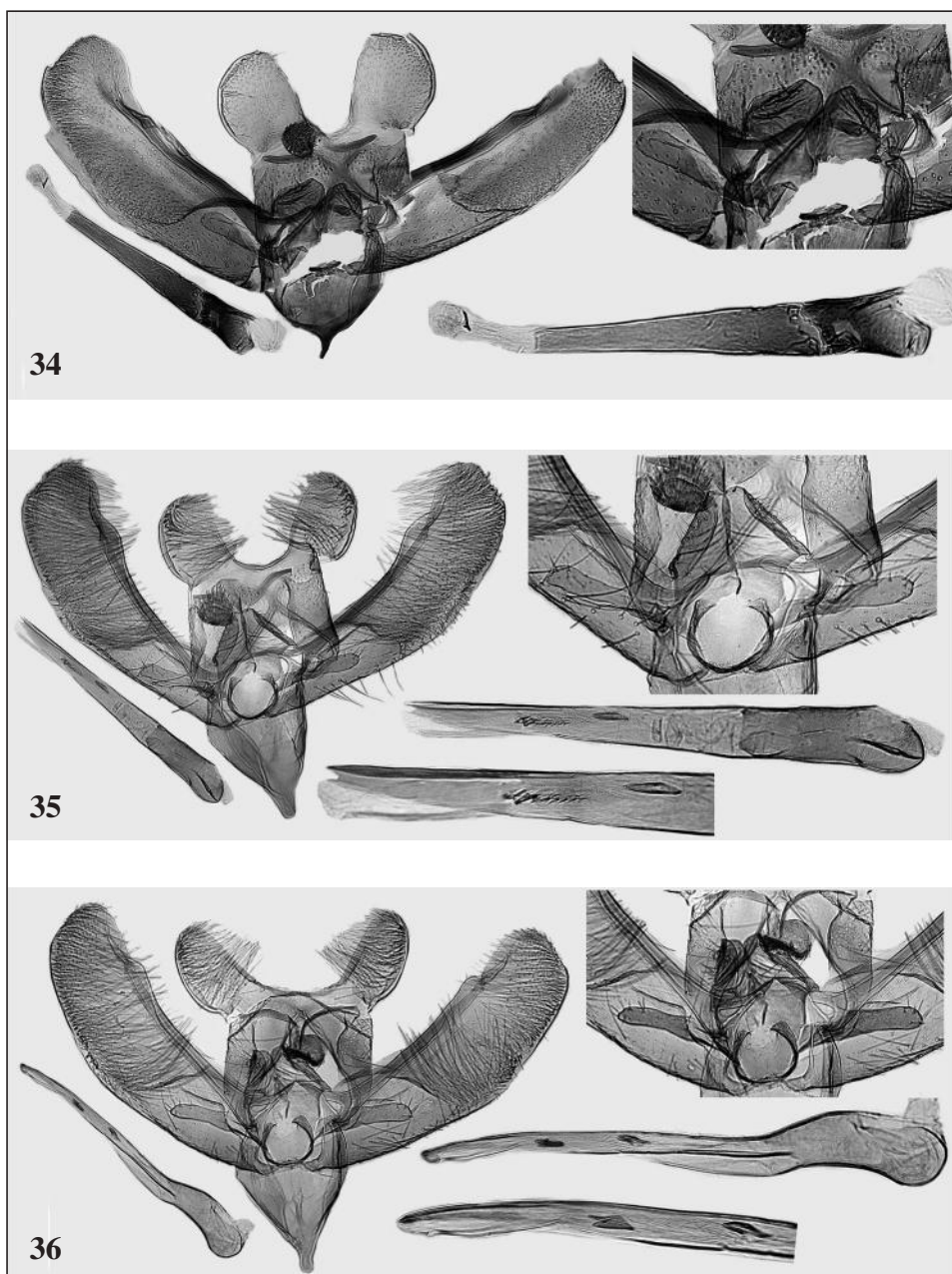




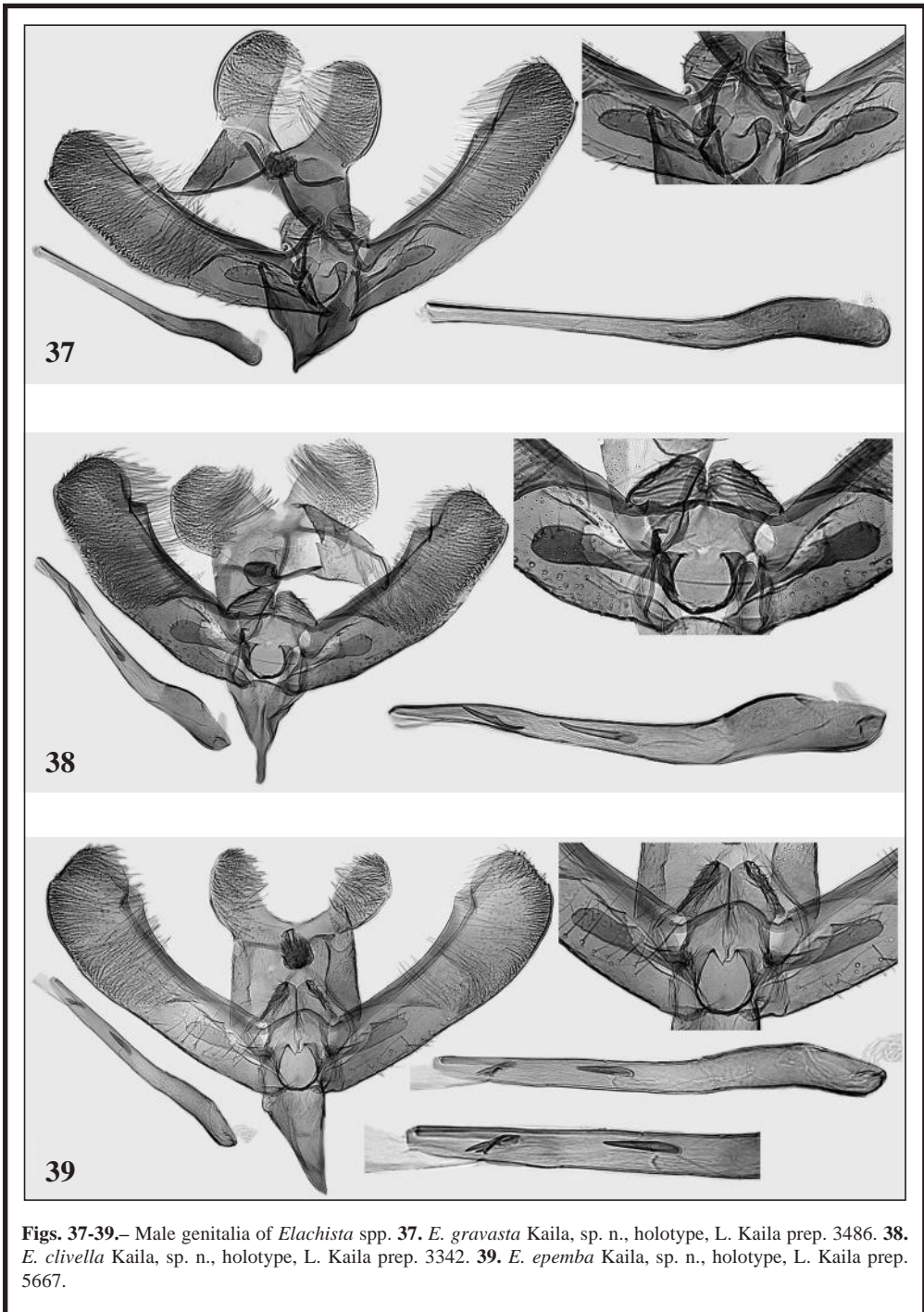


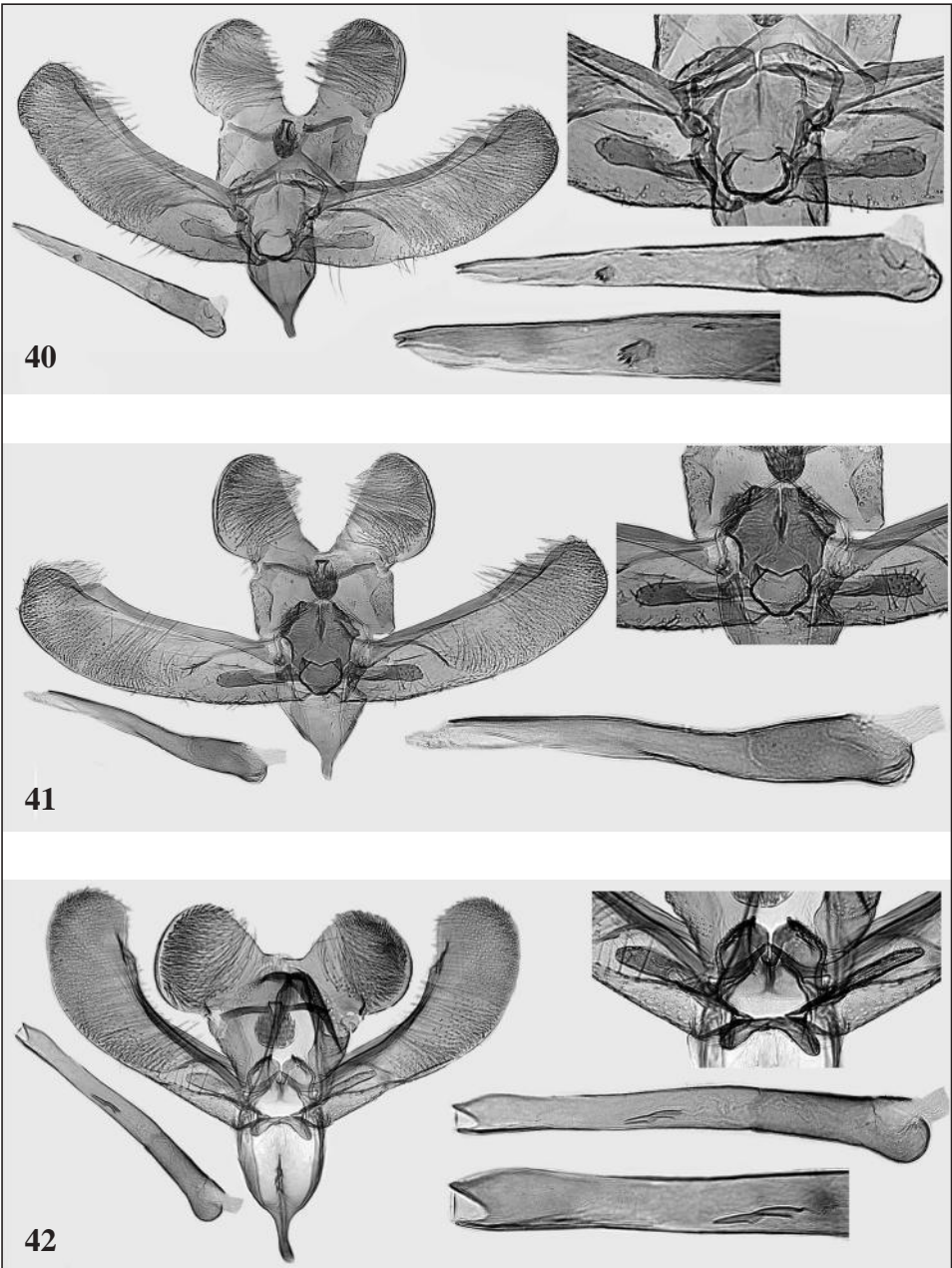
Figs. 28-30.— Male genitalia of *Elachista* spp. **28.** *E. sebastella* Kaila, sp. n., holotype, L. Kaila prep. 5675. **29.** *E. sebastella* Kaila, sp. n., paratype, L. Kaila prep. 4998. **30.** *E. ipirosella* Kaila, sp. n., holotype, L. Kaila prep. 2335.



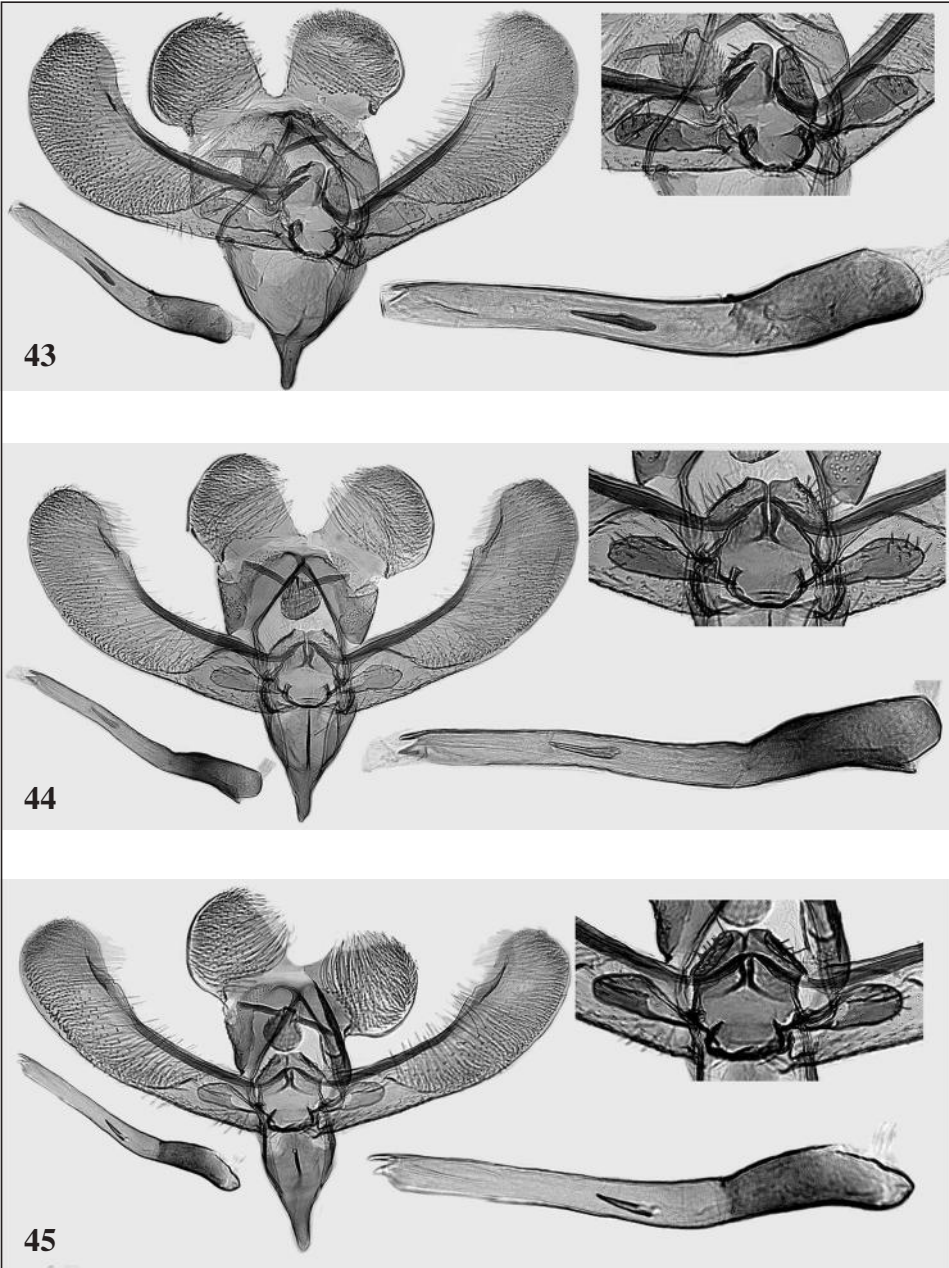


Figs. 34-36.— Male genitalia of *Elachista* spp. **34.** *E. chukotica* Kaila, sp. n., holotype, BÅB (B. Bengtsson) slide 396X. **35.** *E. enaula* Kaila, sp. n., holotype, L. Kaila prep. 5666. **36.** *E. enaula* Kaila, sp. n., paratype, L. Kaila 5665.

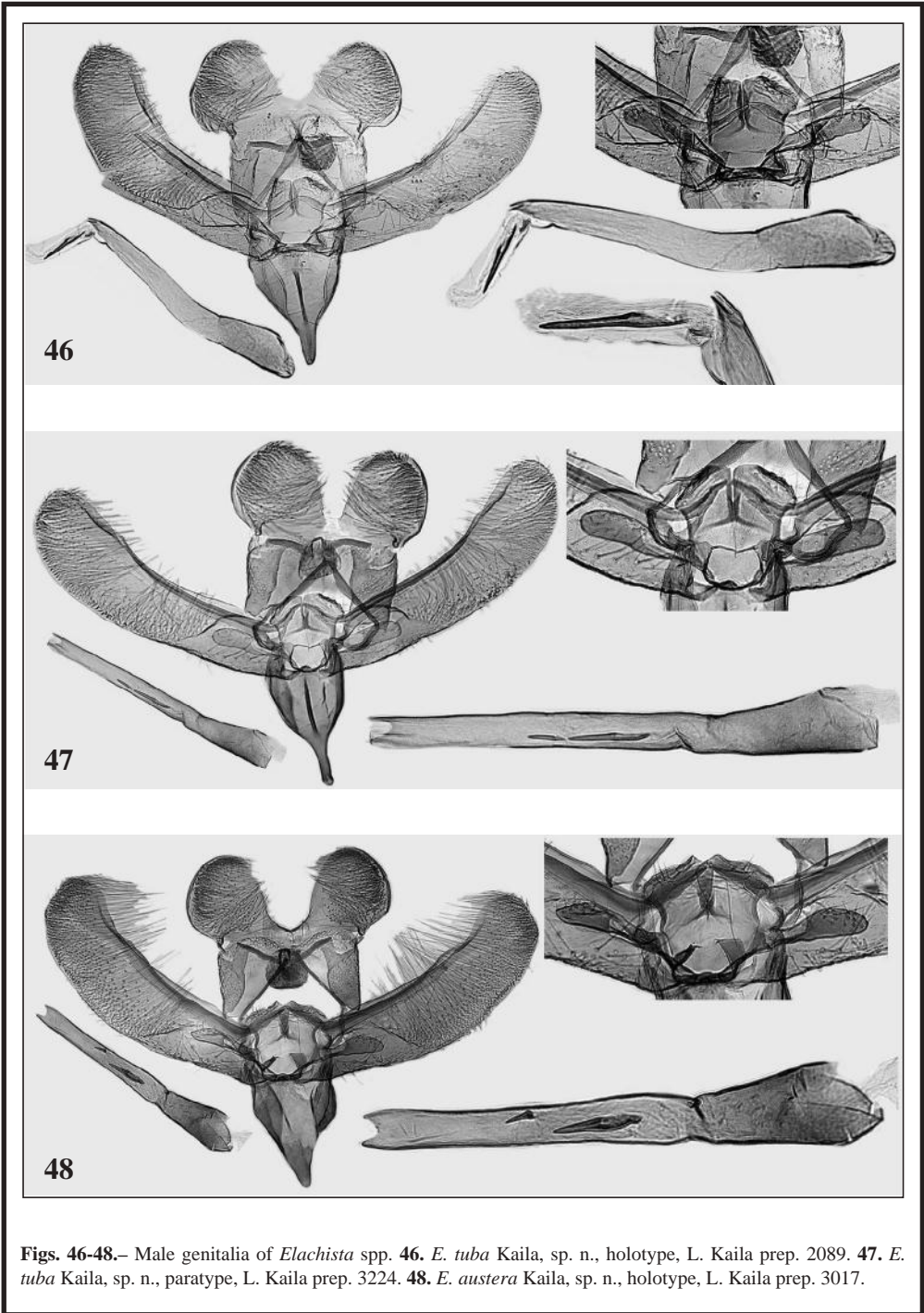




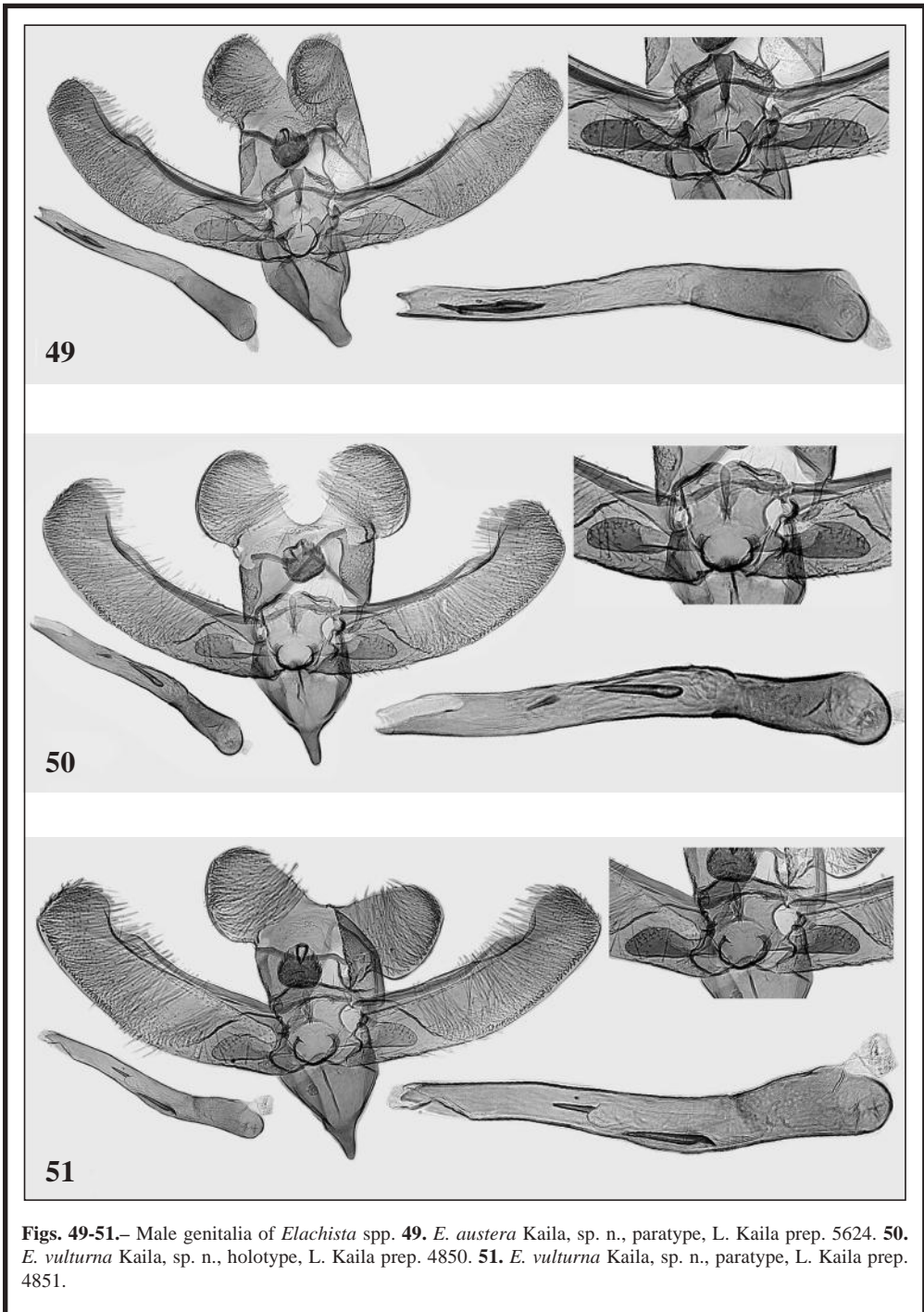
Figs. 40-42.— Male genitalia of *Elachista* spp. **40.** *E. diodia* Kaila, sp. n., holotype, L. Kaila prep. 4885. **41.** *E. diodia* Kaila, sp. n., paratype, L. Kaila prep. 1208. **42.** *E. subnigrella* Douglas, L. Kaila prep. 5601 (Sweden).

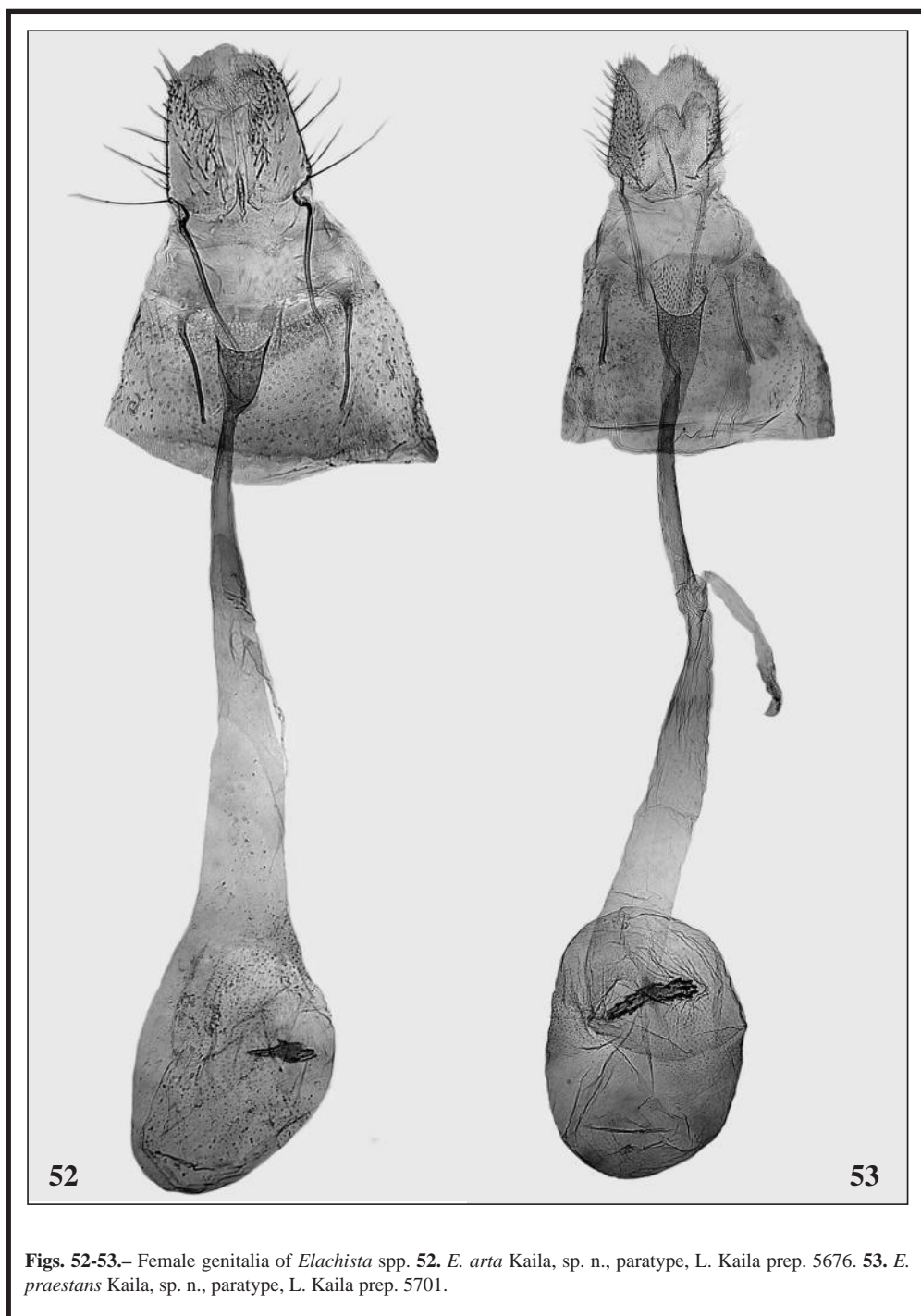


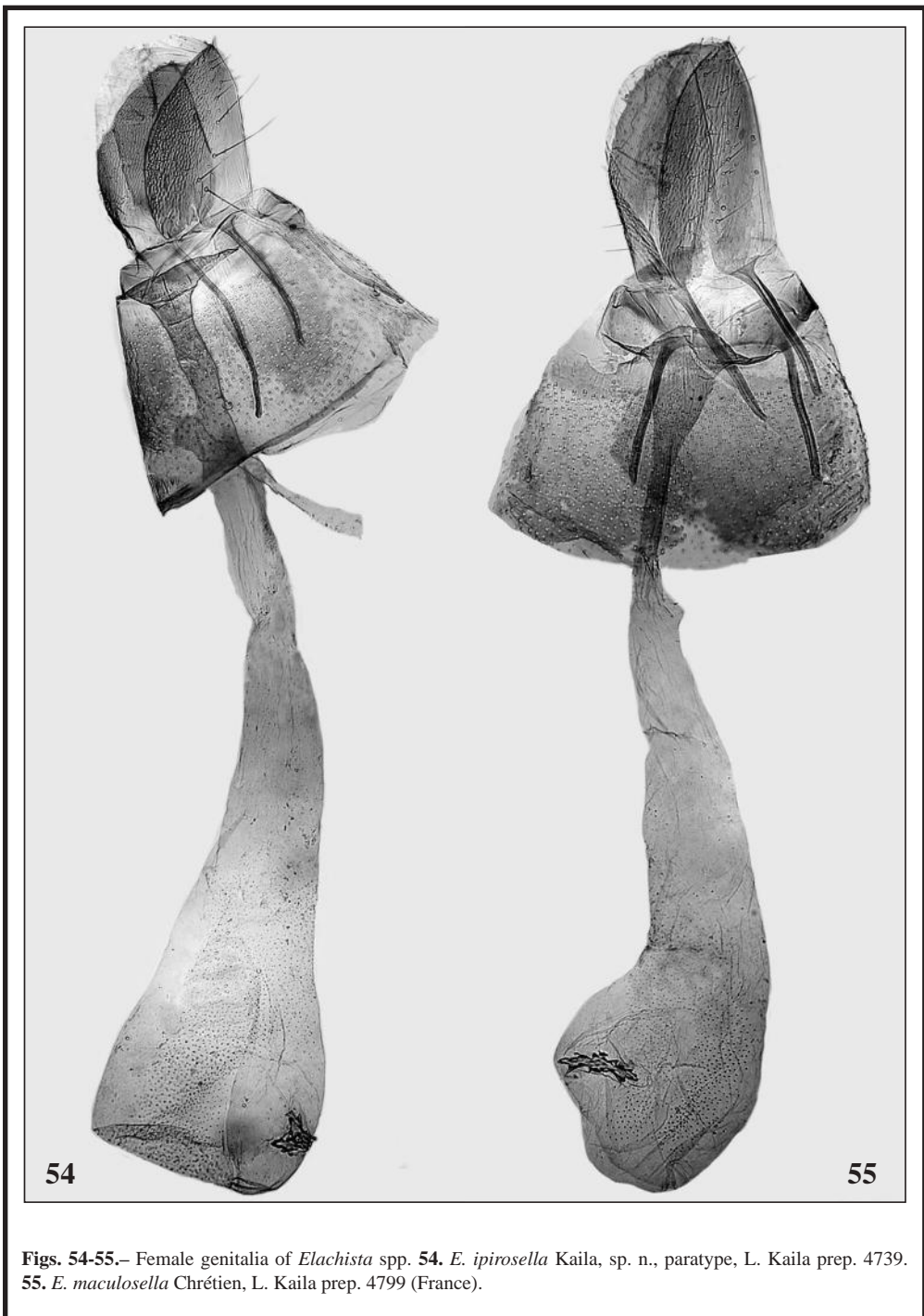
Figs. 43-45.— Male genitalia of *Elachista* spp. **43.** *E. subnigrella* Douglas, L. Kaila prep. 5602 (Denmark). **44.** *E. tephрина* Kaila, sp. n., holotype, L. Kaila prep. 418. **45.** *E. tephрина* Kaila, sp. n., paratype, L. Kaila prep. 5678.

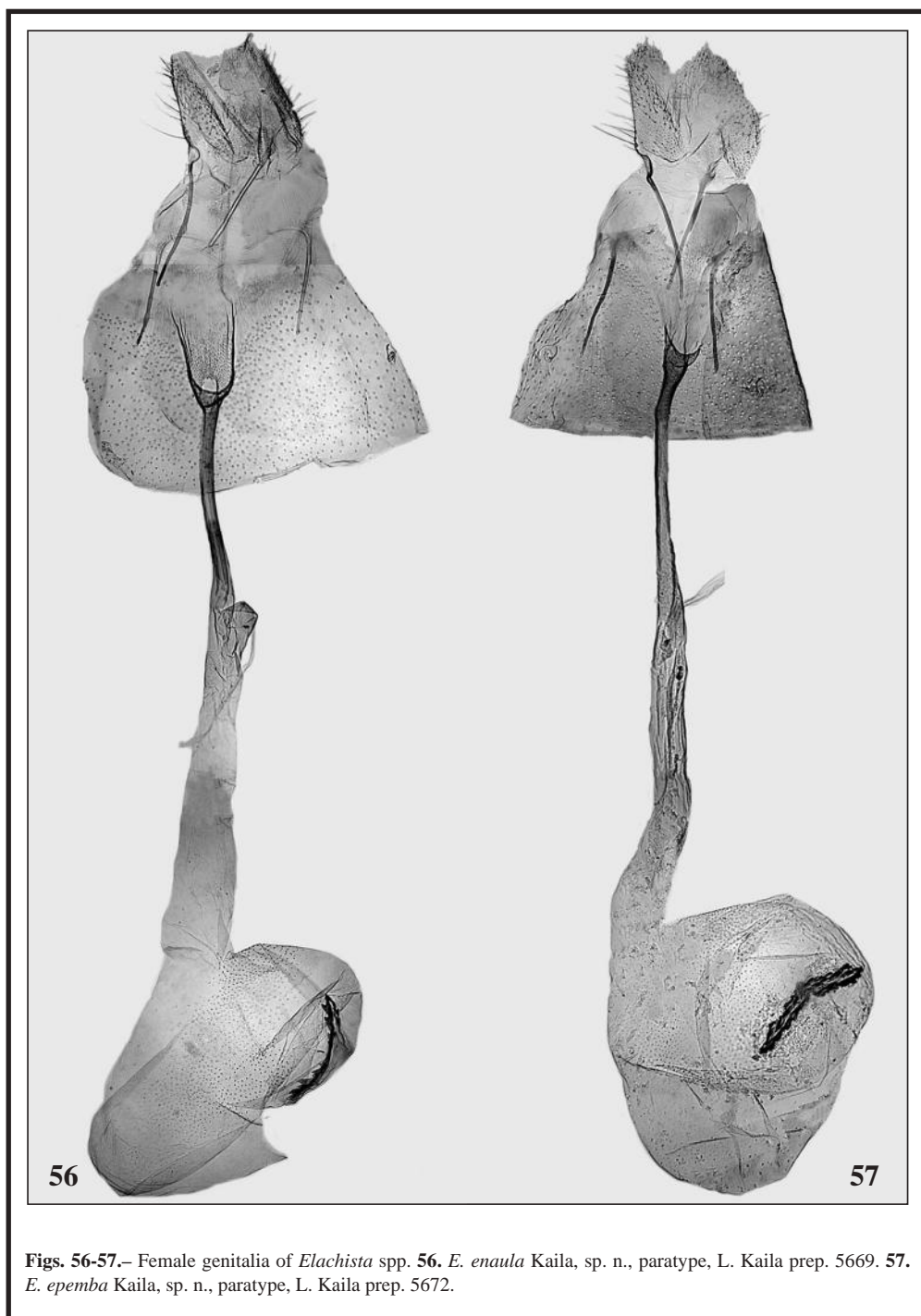


Figs. 46-48.— Male genitalia of *Elachista* spp. **46.** *E. tuba* Kaila, sp. n., holotype, L. Kaila prep. 2089. **47.** *E. tuba* Kaila, sp. n., paratype, L. Kaila prep. 3224. **48.** *E. austera* Kaila, sp. n., holotype, L. Kaila prep. 3017.

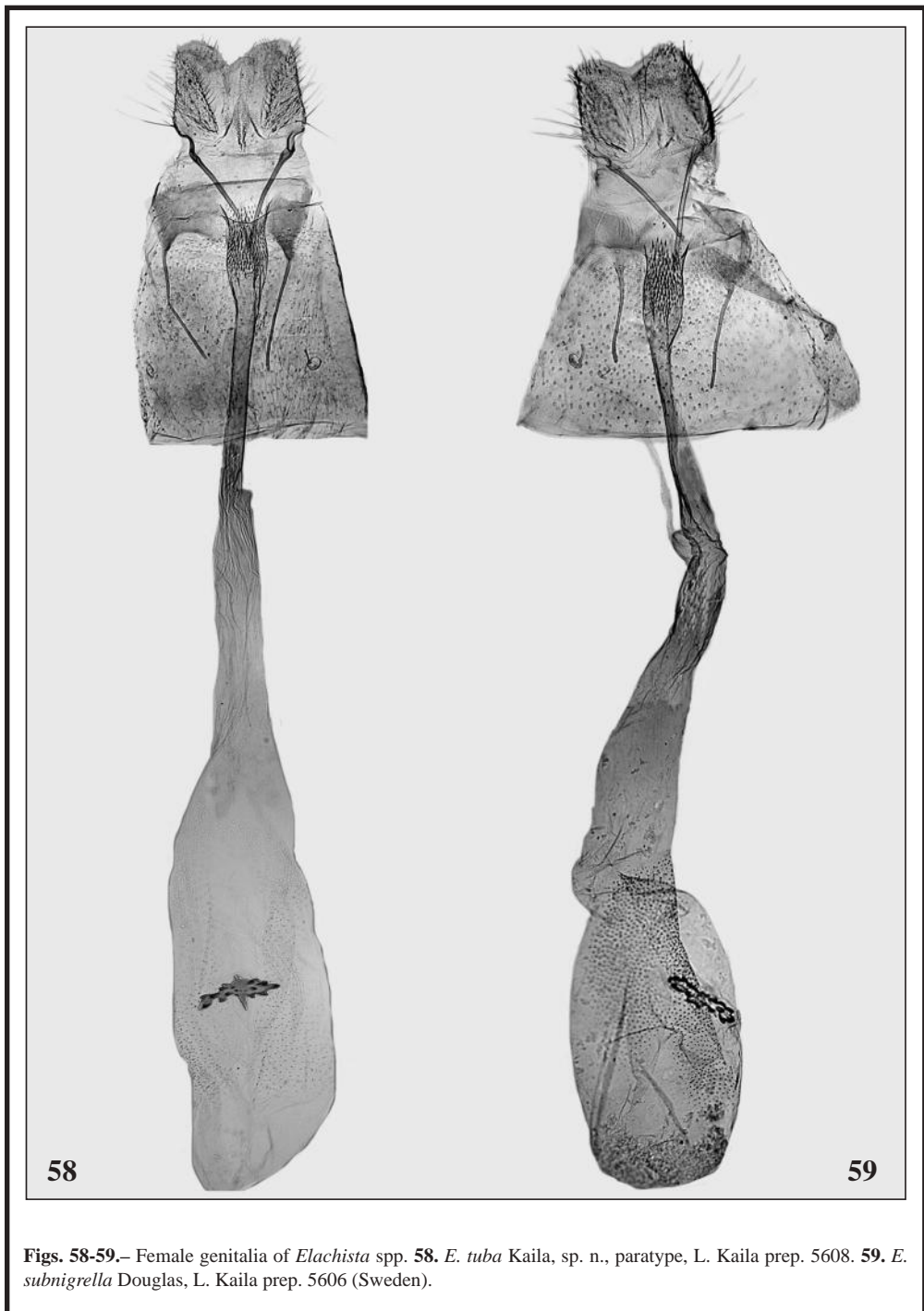




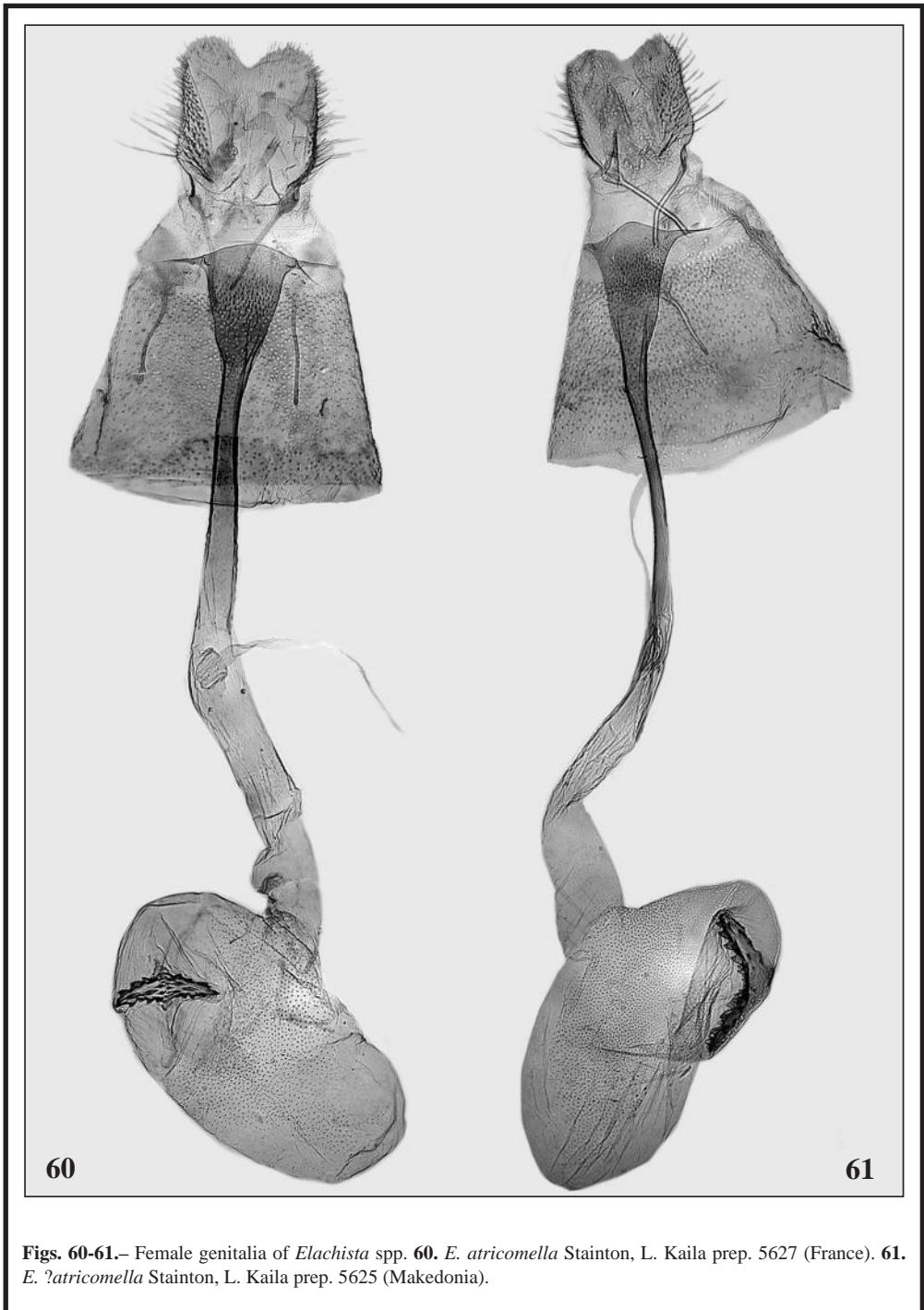




Figs. 56-57.— Female genitalia of *Elachista* spp. **56.** *E. enaula* Kaila, sp. n., paratype, L. Kaila prep. 5669. **57.** *E. epemba* Kaila, sp. n., paratype, L. Kaila prep. 5672.



Figs. 58-59.— Female genitalia of *Elachista* spp. **58.** *E. tuba* Kaila, sp. n., paratype, L. Kaila prep. 5608. **59.** *E. subnigrella* Douglas, L. Kaila prep. 5606 (Sweden).



Figs. 60-61.— Female genitalia of *Elachista* spp. **60.** *E. atricomella* Stainton, L. Kaila prep. 5627 (France). **61.** *E. ?atricomella* Stainton, L. Kaila prep. 5625 (Makedonia).

